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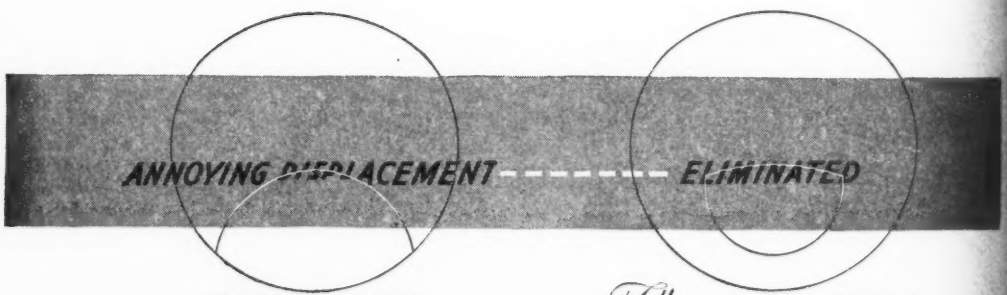

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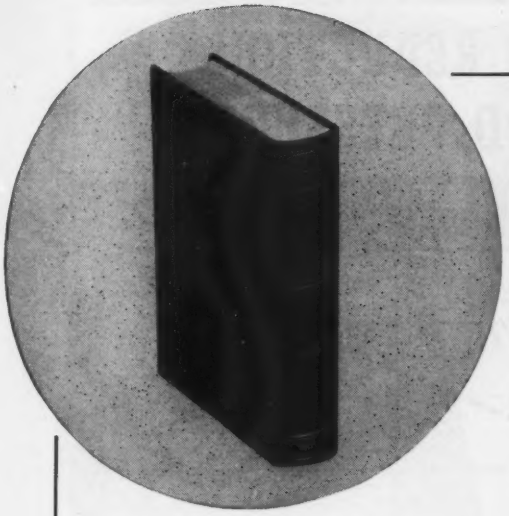

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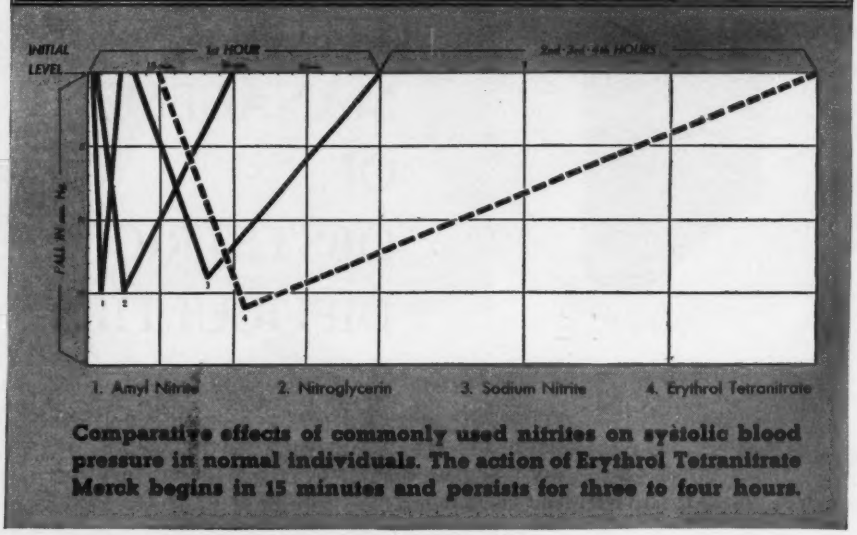

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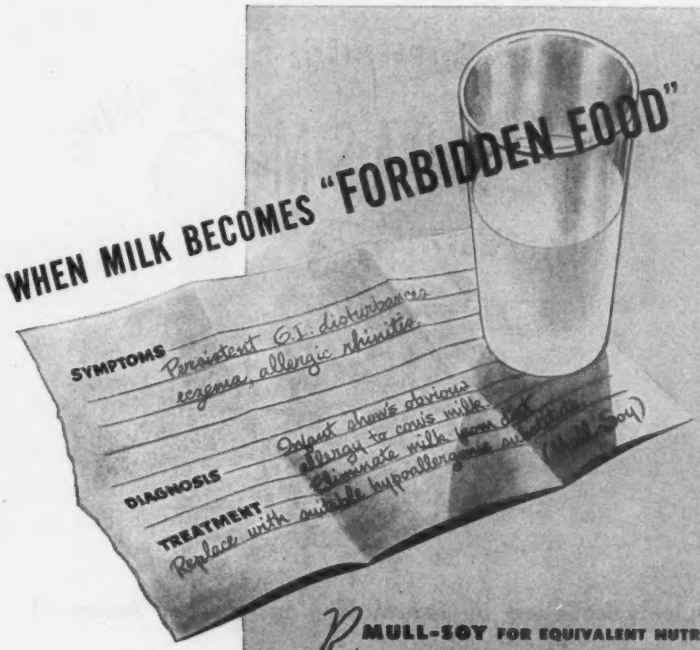

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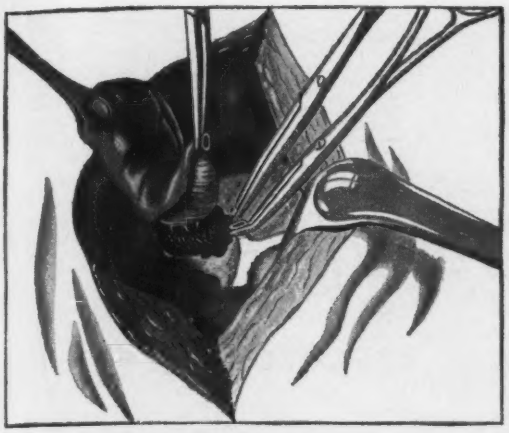

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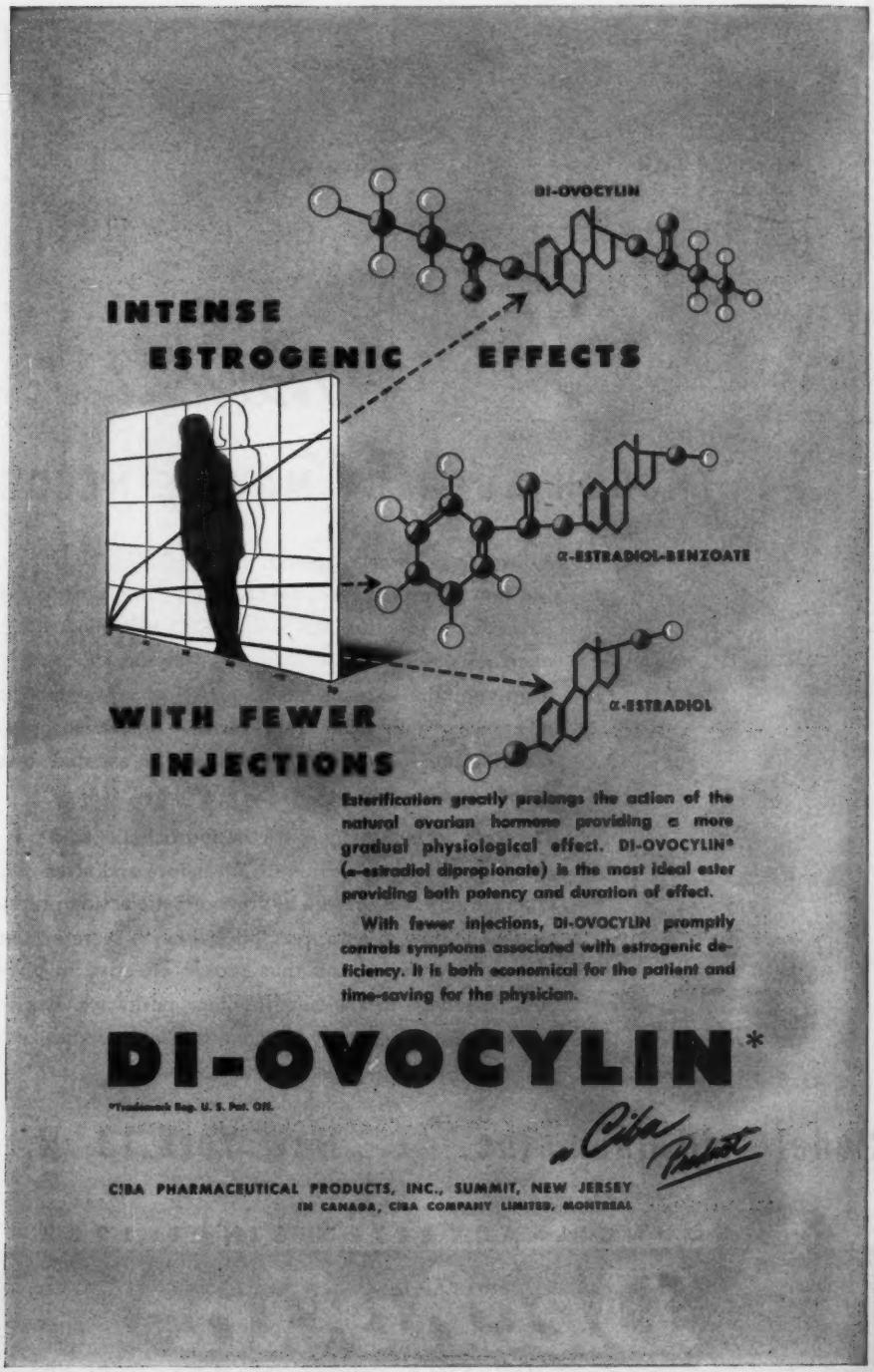
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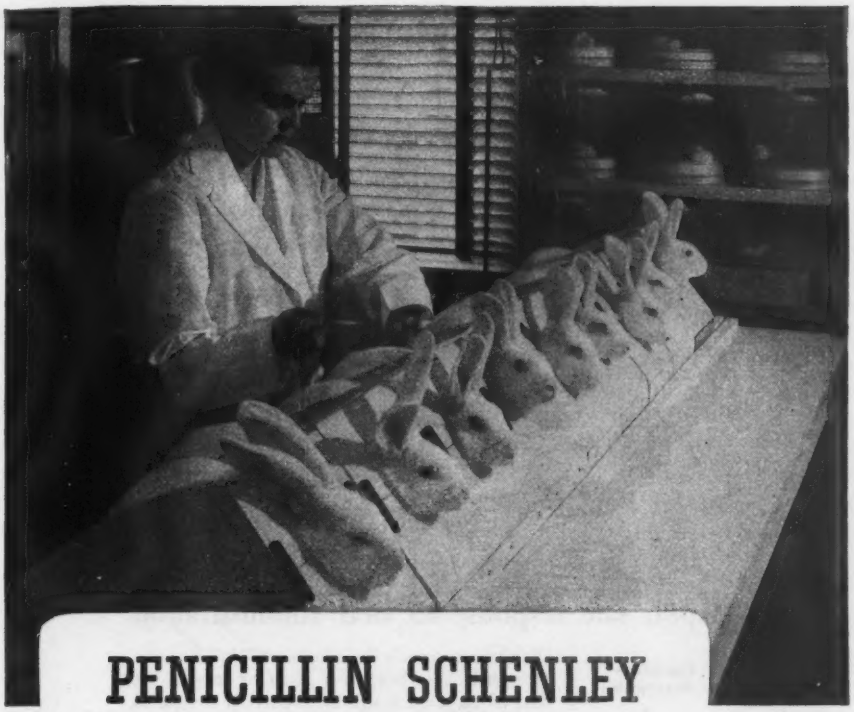

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1. Science, *97*:385, 1943. 2. J. A. M. A. *119*:945, *120*:831, 1943; Digest of Treatment, *6*:835, 1943; New England J. Med. *228*:8, 1943. 3. New England J. Med. *228*:118, 1943. 4. South. Med. J. *34*:89, 1941.

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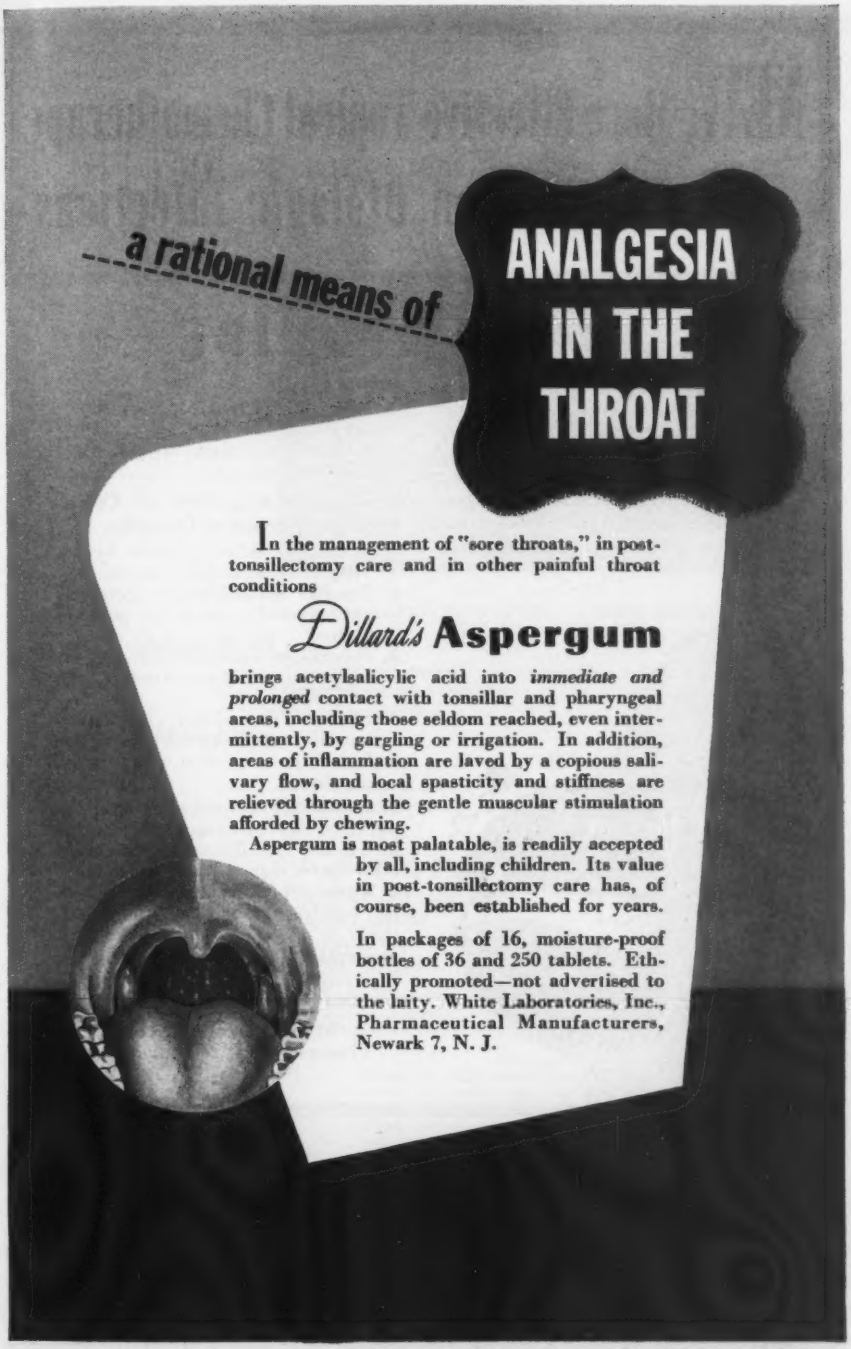
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brings acetylsalicylic acid into *immediate and prolonged* contact with tonsillar and pharyngeal areas, including those seldom reached, even intermittently, by gargling or irrigation. In addition, areas of inflammation are laved by a copious salivary flow, and local spasticity and stiffness are relieved through the gentle muscular stimulation afforded by chewing.
Aspergum is most palatable, is readily accepted by all, including children. Its value in post-tonsillectomy care has, of course, been established for years.
In packages of 16, moisture-proof bottles of 36 and 250 tablets. Ethically promoted—not advertised to the laity. White Laboratories, Inc., Pharmaceutical Manufacturers, Newark 7, N. J.

NEW, More Effective Topical Chemotherapy for Common Otologic Infections

White's OTOMIDE

is a stable solution of sulfanilamide and carbamide (urea) in glycerin of high specific gravity.

Anhydrous chlorobutanol, a recognized local anesthetic agent *that is therapeutically compatible with sulfonamides* is included in the formula for its analgesic and antipruritic properties.

FORMULA:

Carbamide (Urea).....10%
Sulfanilamide..... 5%
Chlorobutanol (anhydrous). 3%
Glycerin (h.sp.gr.).....q.s.

Therapeutic properties of Carbamide component of Otomide:

1. Chemically debrides lesion by solvent effect on necrotic tissues.
2. Renders sulfanilamide effectively antibacterial even in the presence of pus.
3. Solubilizes sulfanilamide, effects higher tissue concentrations of sulfonamide.
4. Increases diffusibility of sulfanilamide through living and dead tissues.
5. Is free from irritating effect on living tissues.

INDICATIONS: Local management of suppurative and non-suppurative otitis media, and of sulfonamide-susceptible infections of external auditory canal.

White's Otomide is available in dropper bottles of one-half fluid ounce (15 cc.).

IMPORTANT: Please note that your patient requires your prescription to obtain this product from the pharmacist.

White Laboratories, Inc.
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Newark 7, N. J.

White's
OTOMIDE

REG. U. S. Wyeth PAT. OFF.

NOW { *PROTECT AGAINST SCARLET FEVER WITH ONLY* **3** *SMALL INTRADERMAL INJECTIONS*

SCARLET FEVER STREPTOCOCCUS TOXIN

FOR IMMUNIZATION

(TANNIC ACID PRECIPITATED)

WYETH

A WYETH CONTRIBUTION TO IMMUNOTHERAPY

Convenient

This new improvement in immunizing substances provides a simplified, more acceptable method for active immunization against scarlet fever.

Effective

One month after a course of three injections (four for adults), approximately 85% of those treated give negative reactions to the Dick test.*

Preferred by Physicians	*Preferred by Patients*
• RELATIVELY NONTOXIC	• FEWER INJECTIONS
• EASY TO USE	• LESS PAIN
• SAVES TIME	• REDUCED REACTIONS

*VELDEE, M. V.; PECK, E. C.; FRANKLIN, J. P., and Du PUY, H. R.: The Dick Reaction and Scarlet Fever Morbidity Following Injections of a Purified and Tannic Acid Precipitated Erythrogenic Toxin, Public Health Reports 56: 957-975 (May 2) 1941.

PACKAGING	No.
3 Vials—One Immunization (Children's Pkg.)	92
3 Vials—Ten Immunizations (Children's Pkg.)	93
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4 Vials—Ten Immunizations (Adult Pkg.)	95
1 Vial—Single Supplementary Dose (Children or Adults)	96
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Complete information and directions for use are contained in each package. This literature will be sent separately if desired.

Wyeth

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acceptable to the United States Public Health Service for the new rapid treatment of syphilis (August 31, 1944) is Dichlorophenarsine Hydrochloride, U. S. P. This newest anti-luetic is made available by E. R. Squibb & Sons as

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AMPULS FOR *Injection*

There has long been a real need for a potent, mercurial diuretic compound which would be effective by mouth. Such a preparation serves not only as an adjunct to parenteral therapy but is very useful when injections can not be given.

After the oral administration of Salyrgan-Theophylline tablets a satisfactory diuretic response is obtained in a high percentage of cases. However, the results after intravenous or intramuscular injection of Salyrgan-Theophylline solution are more consistent.

Salyrgan-Theophylline is supplied in two forms:

TABLETS (enteric coated) in bottles of 25, 100 and 500. Each tablet contains 0.08 Gm. Salyrgan and 0.04 Gm. theophylline.

SOLUTION in ampuls of 1 cc., boxes of 5, 25 and 100; ampuls of 2 cc., boxes of 10, 25 and 100.

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Brand of MERSALYL and THEOPHYLLINE

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Have confidence in the preparation you prescribe... Specify **"ARMOUR"**

Edema of Unknown Etiology

A pitting edema of the lower extremities is seen at times in patients who have apparently no cardiac or renal lesion. For such cases, SUPRARENAL CONCENTRATE *ARMOUR* often proves most beneficial. In this preparation, the epinephrine present naturally in the fresh glandular tissue has been reduced to a mere trace, and the connective tissue and other inert cellular structures removed. This makes it possible to administer substantial doses of suprarenal gland medication to induce a pharmacologic effect without pronounced gastric or intestinal discomfort. Clinically, SUPRARENAL CONCENTRATE *ARMOUR* seems to influence vascular permeability. A drying and shrinking effect is noted, not only on subcutaneous edema of unknown etiology, but also on the pale, soggy mucous membrane of hay fever. Whether or not it has a place in the treatment of true cardiac or renal edema remains to be determined.

The adult dose is two capsules three times daily with meals until desired effect is obtained—then a maintenance dose as required, usually one capsule t.i.d. It is desirable also to start with one capsule daily and increase by one daily until full dosage is being given.

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Middle age to most men means the peak of their business and social careers. To meet these responsibilities, it should also mean the peak of their physical and mental efficiency.

Easy fatigability, exhaustion, insomnia, increasing indecision and irritability, as well as vasomotor, cardio-vascular, and genito-urinary disorders are often symptoms of endocrine imbalance during the male climacteric.

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the prophylaxis and treatment of rickets is available in once-a-month dosage.

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—as shown in the published work of Wolf, Rambar, Hardy and Fishbein.

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REFERENCES

Wolf, I. J.: J. Ped., 22:396-417 (April) 1943

Rambar, A. C., Hardy, L. M. and Fishbein, W. I.: J. Ped., 23:31-38 (July) 1943

Wolf, I. J.: J. Med. Soc. New Jersey, 38:436 (Sept.) 1941

Wolf, I. J.: J. Ped., 22:707-718 (June) 1943

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This concise booklet, presenting the essential data on the action and uses of Pyridium, together with several full color plates illustrating the pathologic changes in urogenital infections, will be sent to you on request.

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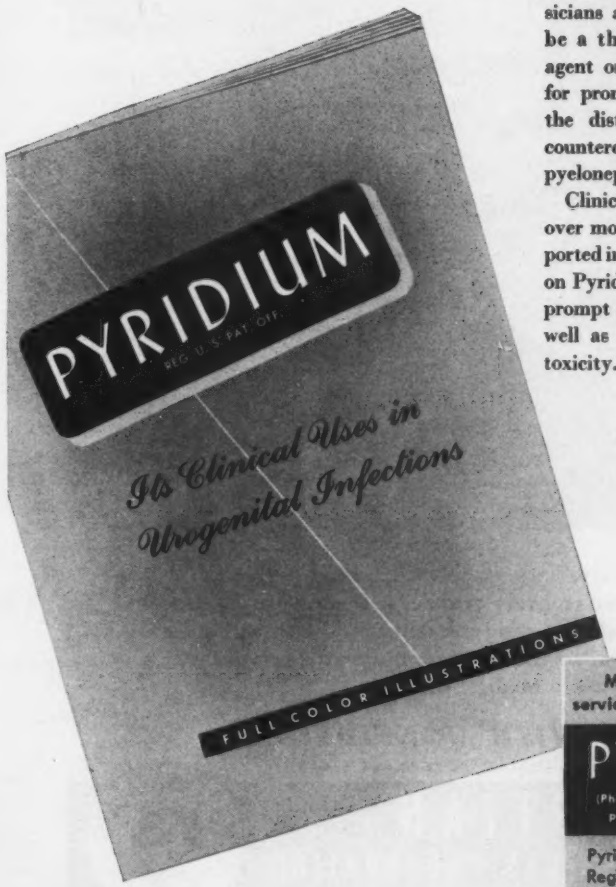

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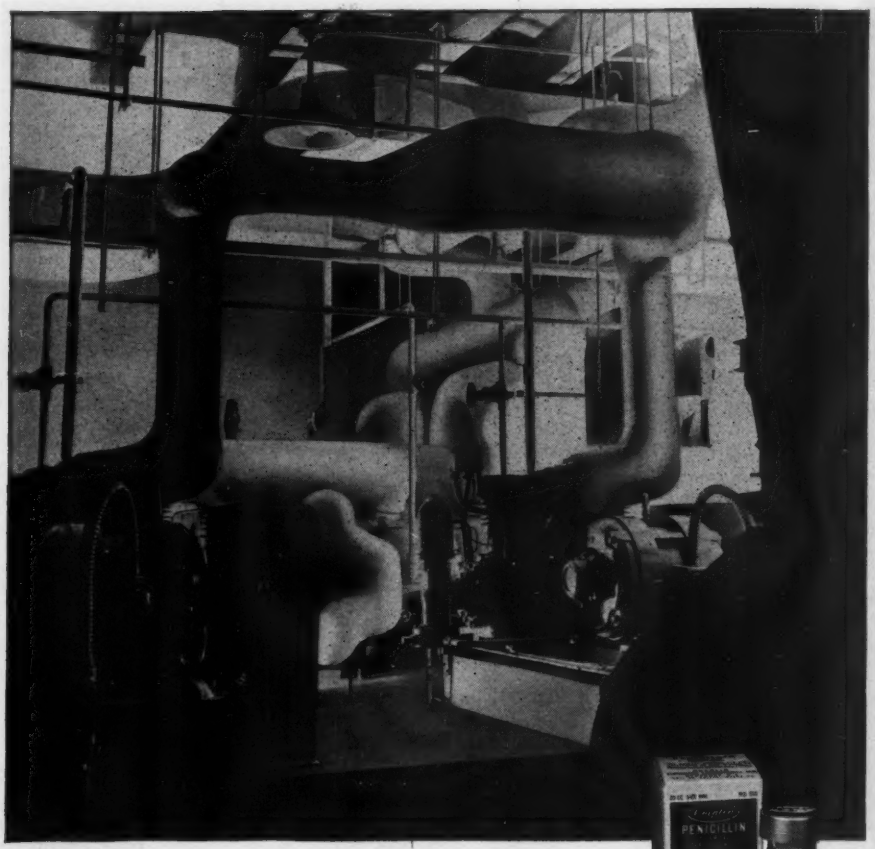

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The Cardiologist

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Being the powdered leaves made into
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TANDEM ACTION
In Iron-Deficiency Anemia

Therapeutic "teamwork" is provided by this rational prescription, specifically designed for treatment of iron-deficiency anemias.

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Brand of Hematinic and Tonic

Simultaneously with the hematinic action of ferrous iron, vitamin B_1 acts to stimulate flagging appetite, improve digestion and assimilation, and thereby hasten hemoglobin response.

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Choice of a career has never been much of a problem for members of the Lilly family. While it is hardly likely that Colonel Eli Lilly so intended, their future was cast when, nearly seventy years ago, he opened the first Lilly Laboratory. Colonel Lilly builded well. The sound business and ethical principles which he cherished have been engendered into the Lilly organization, which has remained a leader in scientific progress into the fourth generation.

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MODIFIED

(WITHOUT CODEINE)

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AN EXCELLENT VEHICLE FOR ADMINISTERING ADDITIONAL MEDICATION

CETRO-CIROSE* Modified is an effective cough remedy that will also serve as an excellent vehicle for the administration of ammonium chloride, benzoin, etc., in cases requiring additional medication. Flavored with wild cherry and menthol, it is well received by children and other taste-conscious patients. Because it is free of sugar, Cetro-Cirose Modified can be used with the assurance that it will not upset the stomach.

EACH FLUIDOUNCE CONTAINS:	
Chloroform	1⅓ minims
Alcohol	1⅓ per cent
Fluidextract of Ipecac	1 minim
Glycerin	240 minims
Potassium Guaiacolsulfonate	8 grains
Sodium Citrate	18 grains
Citric Acid	6 grains

Flavored with Wild Cherry and Menthol.

SUPPLIED in pint and 1 gallon bottles.

ALSO AVAILABLE—Cetro-Cirose containing ½ grain codeine phosphate in each fluidounce.

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In a statistical analysis of 165 cases of anaerobic wound infections from the various theaters of war, MacFarlane* found that both operation and antitoxin must be used for the best results.

For Reduced Reactions . . .

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- **TETANUS-GAS GANGRENE (Combined)**
- **TETANUS**

Refined by the Parfentjev method, Pitman-Moore antitoxins greatly reduce the danger of allergic reactions by altering and removing a high percentage of horse serum proteins.

How Supplied

TETANUS-GAS GANGRENE ANTITOXIN (Combined) 5500 unit diaphragm-stoppered vials. 1500 units of tetanus antitoxin and 2000 units each of perfringens and vibrion septique antitoxins.

TETANUS ANTITOXIN—
Prophylaxis: 1500 unit vial package
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Write for full information

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*MacFarlane, M. G.: The Therapeutic Value of Gas-Gangrene Antitoxin, Brit. M. J., 2:636-640 (1943).

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"From the point of view of preventive medicine, the evidence is conclusive that there is great opportunity to improve the health of the nation by increasing the vitamin B complex content of the diet of a considerable part of our population."[1]

'Tabloid' Yeast Concentrate contains the *entire* B complex, thus providing in addition to well-established factors those lesser known components whose physiological roles are important but difficult to define accurately.

Although 'Tabloid' Yeast Concentrate is prepared from selected brewers' yeast, it does not contain fresh yeast's active enzymes or live cells which may cause intestinal fermentation, abdominal discomfort.

1. Sebrell, W. H., Ann. Int. Med. 15:953, 1941.

Preparation: 'Tabloid' Yeast Concentrate, gr. 4 (0.26 gm.) Sugar coated. Bottles of 100 and 500. Dosage: Depending on the degree of Vitamin B complex deficiency—1-3: t. i. d., a.c.

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"FOR ALL PATIENTS IN NEED OF IRON

it is desirable to use a compound which gives good results with the least discomfort."*

FERGON rarely causes gastric distress even when taken before meals, for its low degree of ionization makes it virtually non-astringent and non-irritating. Ferrous gluconate is utilized with greater efficiency as demonstrated by clinical comparison with other iron compounds.*

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SUPPLIED as 5% elixir, bottles of 6 fl. oz. and 16 fl. oz.; 2½ grain tablets, bottles of 100, 500, and 1000.

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MORE EFFICIENT utilization of iron is demonstrated in clinical studies comparing ferrous gluconate with other iron salts. It is readily soluble throughout the entire pH range of the gastro-intestinal tract.

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FURTHER FACTS FOR YOUR REFERENCE FILE AND CLINICAL SAMPLES WILL BE GLADLY SENT ON REQUEST

*Reznikoff, P. and Goebel, W. F.: J. Clin. Investigation 16:547, 1937.

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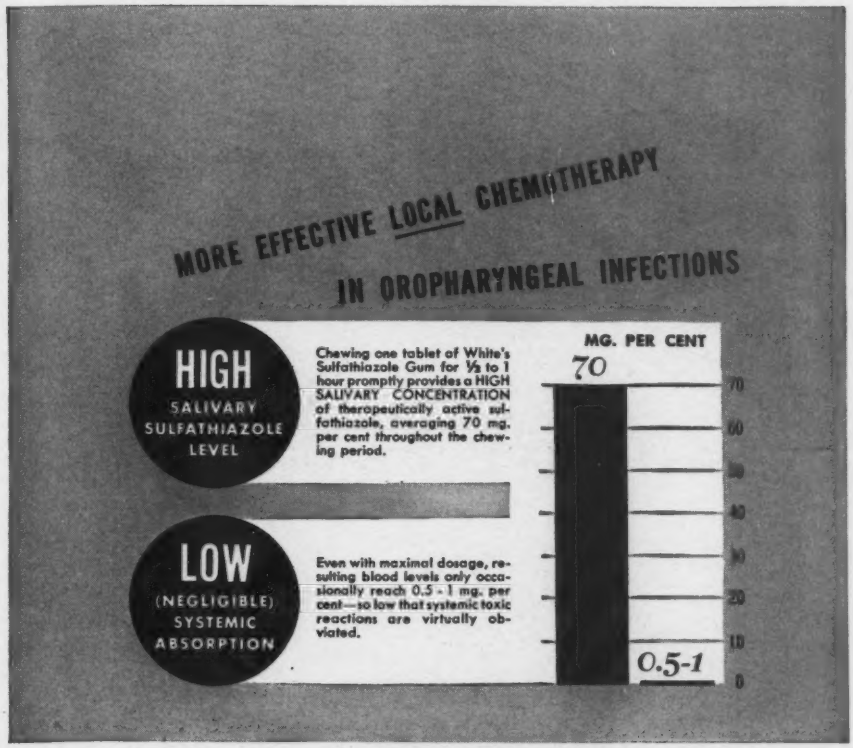
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SALIVARY SULFATHIAZOLE LEVEL
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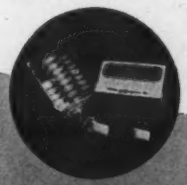
LOW
(NEGLIGIBLE) SYSTEMIC ABSORPTION
Even with maximal dosage, resulting blood levels only occasionally reach 0.5 - 1 mg. per cent—so low that systemic toxic reactions are virtually obviated.
MG. PER CENT
70
0.5-1

White's **SULFATHIAZOLE GUM***

SUPPLIED IN PACKAGES OF 24 TABLETS, SANITAPED IN SLIP-SLEEVE PRESCRIPTION BOXES

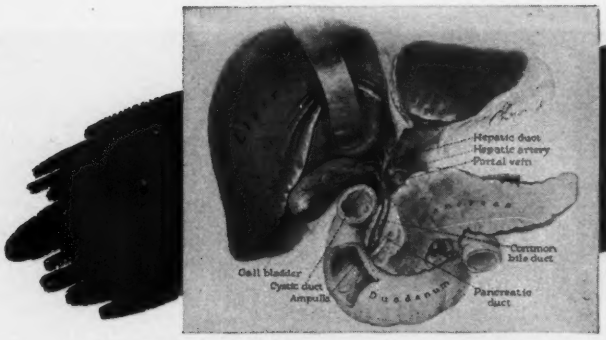


provides an efficient and practical method of effecting *immediate* and *prolonged* topical chemotherapy in oropharyngeal areas not similarly reached with gargles, sprays or irrigations.

INDICATIONS: Local treatment of sulfonamide-susceptible infections of oropharyngeal areas: acute tonsillitis and pharyngitis; septic sore throat; infectious gingivitis and stomatitis, including Vincent's disease. Also indicated in the prevention of local infection secondary to oral and pharyngeal surgery.

IMPORTANT: Please note that your patient requires your prescription to obtain this product from the pharmacist.

* A PRODUCT OF WHITE LABORATORIES, INC. PHARMACEUTICAL MANUFACTURERS, NEWARK 7, N. J.



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In a careful clinical study of more than 500 patients, the authors* report . . . . .

"SORPARIN was found to be most effective clinically with those patients suffering from liver disease, primary or secondary. The specific conditions included hepatitis with and without jaundice, chronic cholecystitis with and without stone, cirrhosis, post-surgical biliary states, diabetes mellitus, Banti's syndrome and chronic passive congestion of the liver . . .

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*DeLor, C. J. and Means, J. W.: Clinical Studies on the Berry of Sorbus Aucuparia, Rev. Gastroenterol., 11:319-327 (Sept-Oct) 1944.

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RELIEVE PAIN
IN ARTHRITIS . . .

Without the wheal and woe OF URTICARIA

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*REG. U. S. PAT. OFF.

1. Cohen, A., and Rosen, H.: Arch. Physical Therapy 21:12, 1940.

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A-B-M-C OINTMENT

(0.25% ACETYL-BETA-METHYLCHOLINE CHLORIDE)

Wyeth

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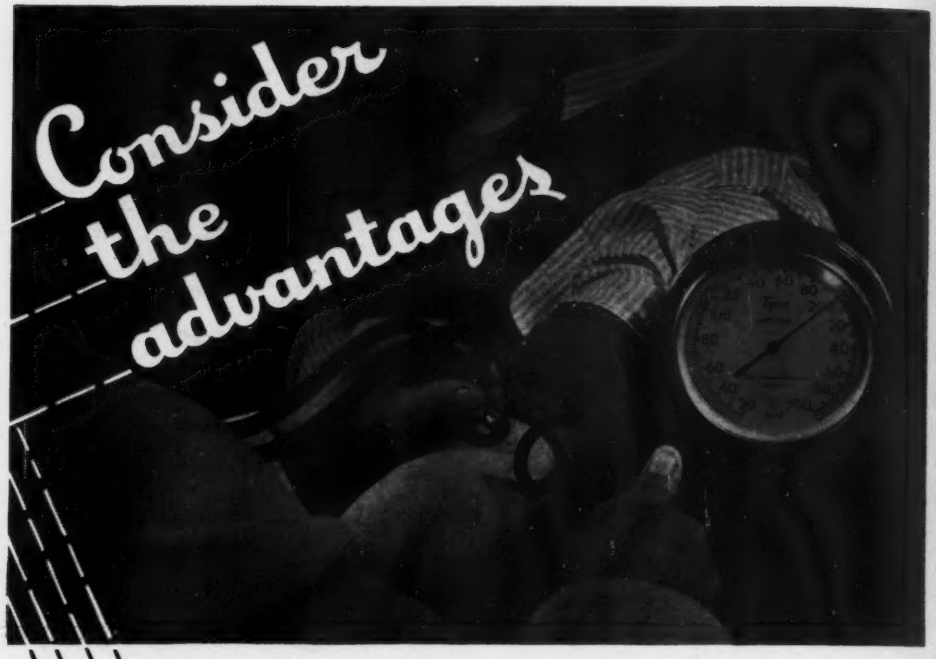

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HALABEX—Yeast Vitamine Tablets (HARRIS)—containing vitamins wholly supplied by nature, provides *every* known and unidentified factor that exists in brewers' yeast. HALABEX also contains essential amino acids and other nutrients.

HALABEX

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HEXA-HARRIS: Natural B-Complex Tablets, prepared from all vegetable material—2 daily.

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[1] Fellows, E. J.: J. Pharm. & Exper. Ther., 60:178, 183, 1937.
[2] Stevens, M. E. et al: Canad. Med. Assn. J., 48:124, 1943.

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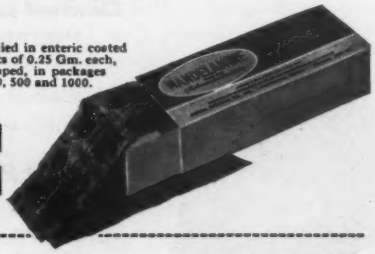

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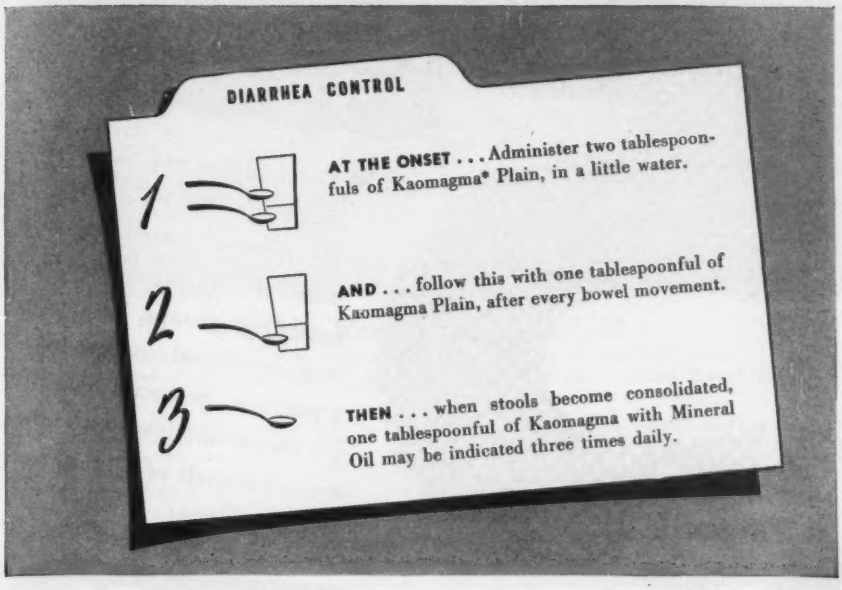
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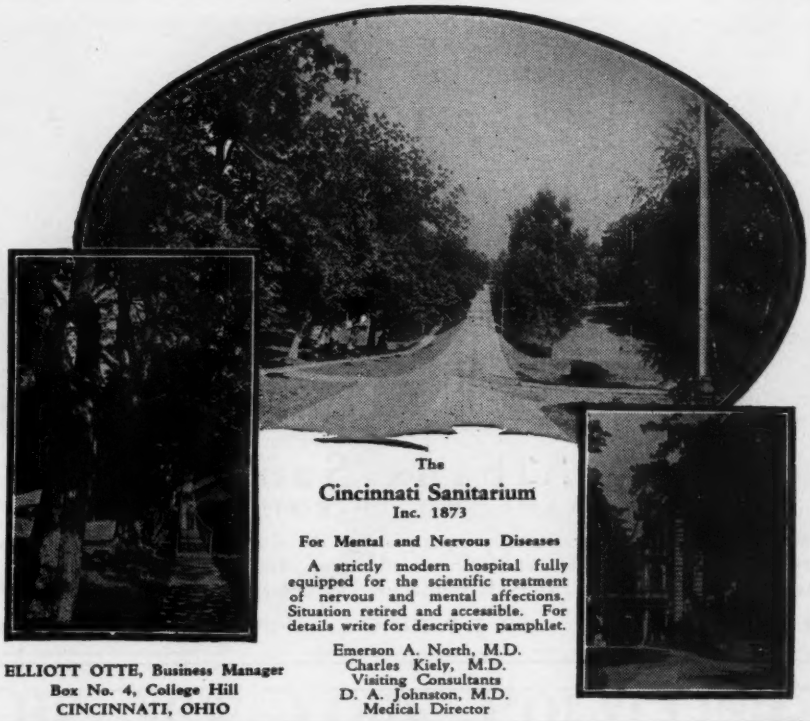

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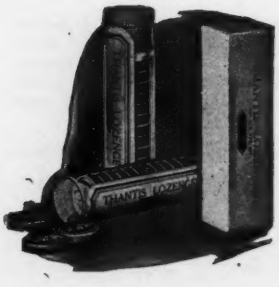

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Volume 38 MARCH 1945 Number 3

DIVERTICULITIS*

INDICATIONS FOR RESECTION

By CURTICE ROSSER, M.D., F.A.C.S.
Dallas, Texas

While diverticulosis was described a century ago and while the changes produced by infection in these intestinal defects were reported by Virchow in 1853, the disease is nevertheless comparatively new to the abdominal surgeon. It is perhaps for this reason that the final decision concerning the details of management of even the more complicated forms of diverticulitis is often left in the hands of the internist. Surgical intervention began in 1907 when W. J. Mayo[1] reported the resection of portions of the sigmoid for diverticulitis in five individuals. During the intervening period, the surgeon has considered that the presence of certain complications transfers the treatment of the lesion to his field, but it is possible that the cautious attitude of our valued medical confreres has continued to overinfluence our own judgment after the disease has become a surgical problem. The standard opinion of fifteen years ago concerning the management of the complications of diverticulitis can best be exemplified by quoting from a joint discussion by Fred W. Rankin and Philip W. Brown[2] published in 1929. They stated that the pathologic changes which require surgical intervention occur in the pelvic portion of the colon only and noted that these changes are characterized by very marked fibrous infiltration of the muscularis and the subserosa. They also observed that the obstruction which results from diverticulitis is due to extrinsic inflammatory reaction and contraction of the various coats of the bowel beginning from the outside, in contradistinction to that produced by carcinoma in which the contraction begins from within. They believed it essential to confine surgical operation to chronic complicated cases, or cases of the acute type in which perforation had occurred. Recognizing the definite fibrotic and chronic inflammatory reactions which occurred, these authors and many others advocated drainage by colostomy, and in certain cases subsequent removal of the offending segment or bowel. They also emphasized, however, their opinion that frequently great recession of the growth would occur after drainage and would be sufficient to allow of omission of subsequent resection. They opposed primary resection in the face of complications and diffuse inflammation because it was accompanied by a relatively high mortality rate. Their final conclusion was that while the operation of choice was a graded procedure consisting of colostomy drainage and subsequent resection and anastomosis, that often prolonged drainage by colostomy renders unnecessary further intervention.

The optimum waiting period advocated to determine whether or not sufficient recession would occur was estimated by Rankin and other writers of the period to be one year. It is apparent that the individual whose lesion became so distressing and perilous that his medical attendant called in a surgical consultant was, through this philosophy, sentenced to carry with him a particularly annoying type of fecal fistula for twelve months before any serious decision was to be made concerning subsequent treatment.

In a discussion[3] of this question before this Section five years ago, I advocated this "watch and wait" policy and favored the use of the

*Read in Section on Proctology, Southern Medical Association, Thirty-Eighth Annual Meeting, St. Louis, Missouri, November 13-16, 1944.

*From the Department of Proctology, Southwestern Foundation College of Medicine, Dallas.

Devine type of transverse colostomy because it appeared to be a more endurable artificial anus than the usual double-barreled vent. Within very recent years, however, we have observed in our own work that individuals with stenosing diverticulitis who have carried a colostomy for a prolonged period and, having obtained definite recession of the tumefaction and sufficient increase in the caliber of the bowel lumen to, presumably, permit closure of the colostomy have not infrequently presented themselves later with disturbing recurrences of their disease. The inflammatory reaction may reappear, a tumefaction may recur and by descending into the lower pelvis produce angulation and pain or the patient may suffer from chronic obstipation.

I have recently secured the current opinions of a representative group of proctologists, abdominal surgeons and gastroenterologists on this subject and will incorporate excerpts from their personal communications in the present discussion.

Some of the replies received indicate that a group of excellent surgeons still advocate a prolonged waiting period after colostomy before further steps are contemplated. Richard Cattell, of Boston, for example, replied:

"If obstruction is not relieved by medical treatment, the patient should have a spur type of colostomy of the transverse colon; they are then carefully observed over a period of six to twelve months, never closing the colostomy in less than twelve months. If at the end of this time patency exists, we do not believe a resection is indicated. I agree with you that many of the obstructive cases involving a considerable portion of the bowel will require resection. In addition to this, there is a considerable group of patients in whom you cannot exclude malignancy since bleeding in diverticulitis occurs in about twenty per cent."

In a similar vein, Louis J. Hirschman, of Detroit, said:

"I believe that a fair proportion of patients suffering from diverticulitis can be relieved by a temporary median colostomy which can be safely closed after several months of physiologic rest. The radical removal of a chronically infected area which jeopardizes life, or which would produce continued invalidism through fecal infection, is a mandate for a surgical eradication."

A more definite policy is advocated by Jordan and Fansler. Sara M. Jordan, of Boston, has written:

"We do not have many cases who really need a colostomy. You underline the word 'really,' so I assume you also do not have many cases that need it. If, however, it is done, we believe a resection should be done if the mass is stenosed and fibrosed."

Walter A. Fansler, of Minneapolis, writes:

"Any case which is severe enough to require colostomy should later be resected. I would go further than this and say that any patient who has had two attacks of peri-colitis with symptoms of partial obstruction and the formation of an inflammatory mass should, if age and physical condition permit, have a resection done."

Of special interest, because they demonstrate conclusively the changing concept at the Mayo Clinic concerning this difficult problem, are the following statements from J. Arnold Bargen and John D. Pemberton. Bargen says:

"About 15 per cent of the patients with recurrent attacks of diverticulitis develop obstructive or perforative symptoms severe enough to warrant surgery. Some years ago colostomy alone was performed and the segment of the bowel distal to the colostomy was left intact. Later on, the colostomy was closed without further surgery. In a few of these cases there was a recurrence of the diverticulitis. The difficulty about making a second colostomy was such as to make us feel that once the patient has come to the state of colostomy, it is probably best to resect the diseased segment of the sigmoid."

A similar opinion is expressed by Pemberton:

"When obstructive symptoms, abscess or fistula develops, I feel that surgery is indicated. It is not feasible to make a direct attack on the involved segment because of technical difficulties; instead, a colostomy should be established. After the lapse of three or preferably six months operation should be undertaken for the resection of the involved segment by means of an exteriorization operation.

"Occasionally, because of the very marked subsidence of the inflammation, one is tempted to close the colostomy without resecting the segment of bowel involved. I have done this on several occasions, often followed by recurrence of the inflammatory process. When the process has been severe enough to necessitate the establishment of a colostomy, it is far wiser to follow up later by an operation for removal of the affected segment of bowel than to close the colostomy."

Possibly because of the advent of protective sulfa premedication and the safety secured by prolonged preparation, some American surgeons not only advocate prompt resection of these lesions but dispense with a preliminary colostomy. Harry E. Bacon, of Philadelphia, for example regards colostomy as a palliative procedure only and believes that resection is indi-

cated in the presence of chronic obstruction, perforation, fistula and marked peri-colitis. Bacon also calls attention to the present tendency to the immediate establishment of bowel continuity and says that he has recently adopted primary anastomosis in many cases of diverticulitis. He suggests a supplementary enterostomy performed at the same time preferably using the appendix. The appendicostomy is permitted to close in a week.

Wayne Babcock, also of Philadelphia, feels that great harm is done by palliation and procrastination in the case of acute diverticulitis of the sigmoid.

"My tendency is to do a radical resection early, and as a rule we have been able to accomplish this at the time of the primary operation. In every case of perforation, or fistula, seen since 1940, we have performed primary resection without additional mortality. It has been a surprise to me that in many of our large clinics the surgical treatment used has been inadequate and a cause of prolonged invalidism."

The foregoing expressions of present opinion indicate a definite and widespread trend toward the more radical surgery essential to the permanent eradication of a lesion which will otherwise serve as a chronic focus of infection, a constant bar to proper elimination and a continuous opportunity for perilous intra-abdominal complications.

Our own observation in recent years has confirmed the wisdom of this changed attitude on the part of surgeons and diseased segments of colon removed have themselves demonstrated the necessity for their extirpation, as the following examples will illustrate:

M. L. T., a white man of 62 years, presented himself in January, 1943, with a history of the passage of blood from the bowel for two years, increasing constipation, the occasional passage of flatus by urethra and a weight loss of ten pounds. The roentgenogram demonstrated the presence of an obstructing lesion in the lower sigmoid with attachment to the bladder. A transverse colostomy was constructed and three months later 16 cm. of the colon was removed with anastomosis of the bowel ends, the colostomy being closed later. The pathologic report was as follows:

Gross appearance: The wall of the colon and adjacent fatty tissue are markedly indurated. Several polyps are present on the mucosa; the largest, which is firm and dark blue, measures 1.5 x 0.8 cm. The lumen is markedly constricted, and the bowel wall contains small sinuses filled with fecal material.

Microscopic findings: Sections from the largest polyp show a sharp transition from its covering of simple columnar epithelium to cells showing irregular nuclei, mitotic figures and dark staining cytoplasm. The muscular layer of the bowel wall shows marked fibrous thickening and is surrounded by a thick layer of dense collagenous connective tissue infiltrated by lymphoid cells. Other sections from the sigmoid show diverticula, the lumen of which contain fecal material.

Pathological diagnosis: (1) Chronic diverticulitis, and (2) Early malignant degeneration of polyp of sigmoid colon (adenocarcinoma grade I).

This patient, whose urinary fistula had closed during the period of colostomy drainage, still had in his intestinal tract a chronically infected, stenosed lesion which was apparently permanent in nature and in addition a malignant tumor whose presence, even though purely coincidental, could not have been detected in any other way than by removal of the segment.

F. H. M., a white man of 55 years, was seen late in 1943 with a history of long standing mild indigestion with a tendency to recurrent diarrhea. A diagnosis of diverticulosis had been made by x-ray several years previously. Ten days previous to my examination the patient had observed a massive hemorrhage from the bowel and there had been an increase in his diarrhea associated with mild abdominal cramping. A roentgenogram demonstrated partial obstruction in the sigmoid associated with diverticulosis. The clinical course continued unchanged for three weeks, after which a second x-ray examination was done with the same findings. A transverse colostomy was constructed in November, 1943, and five weeks later 11 cm. of the sigmoid were resected, end-to-end anastomosis being done. The enterostomy was closed in February, 1944. The tissue report was as follows:

Gross appearance: The lumen of the resected portion of the colon is markedly narrowed by the thick and indurated wall which measures up to 1.8 cm.; cut sections reveal three openings filled with soft necrotic material, one containing a fecolith.

Microscopic findings: Marked alteration of intestinal wall. The mucosa is fairly well preserved but the submucosa shows marked fibrous thickening and diffuse infiltration with all types of inflammatory cells. This process extends toward the muscularis.

Pathologic diagnosis: Chronic inflammatory process of the wall of the colon (diverticulitis) with abscess formation.

This individual, who had been under the care of physicians intermittently for some years, was demonstrated to have a chronic focus of infection and a permanent type of stenosis of the bowel.

E. I., a white man, aged 48, was first seen by me eight years ago in consultation with a gastro-enterologist, and since that time he had experienced repeated attacks

of abdominal pain associated with chills and fever, distension and occasional smears of blood on the stool. He became completely incapacitated in June of 1944, at which time I advised the patient to have a colostomy and resection of his tumor. Two months later a transverse colostomy was done and after a further period of two months a segment of the sigmoid measuring 15 cm. in length was resected (*Fig. 1*) and open anastomosis done. The spur of the transverse colostomy was clamped one week later and the fistula closed.

The pathologic report follows:

Gross appearance: The lumen of the resected sigmoid is markedly narrowed, measuring about 3 cm. in diameter. Two small openings are seen in the mucosa leading into sinuses from which fecal and purulent material may be expressed. There are two small corresponding perforations on the peritoneal surface of the bowel surrounded by fibrino-fibrous tissue. In addition, there is present a round smooth nodule attached to the mucosa on a broad, short pedicle.

Microscopic findings: (*Fig. 2.*) The mucosa around the diverticular openings is missing and is replaced by papillated granulation tissue densely infiltrated by masses of inflammatory cells. The wall of the bowel shows diffuse infiltration with the same type of cells and, in addition, marked proliferation of connective tissue. The wall is markedly thickened, measuring about 3 cm. Sections from the small tumor show it to be composed of adipose tissue.

Pathological diagnosis: (1) Chronic diverticulitis with perforations and marked connective tissue deposit in the bowel wall with resulting narrowing of the lumen, and (2) Lipoma of the sigmoid.

Here is an individual who after eight years of semi-invalidism, palliated from time to time by excellent medical care, still carried in his abdomen a permanently infected and crippled segment of bowel.

COMMENT

It is agreed that the major manifestations of diverticulosis occur in the sigmoid regardless of the extent of the preceding diverticulosis. This localization is apparently due to the smaller bowel calibre, the presence of firmer fecal masses more likely to produce fecaliths in the pockets and the tendency of the bolus to be retained for long periods above the rectosigmoid canal. For this reason, extirpation of involved segments in this area gives promise of permanent relief from serious complications.

We now know that bleeding from the bowel may be produced by both diverticulitis and carcinoma and that diverticulosis may coexist with malignant tumors. The absolute differentiation

Fig. 1
Photograph of segment of colon removed showing chronic inflammation in sinuses and marked fibrosis of wall.

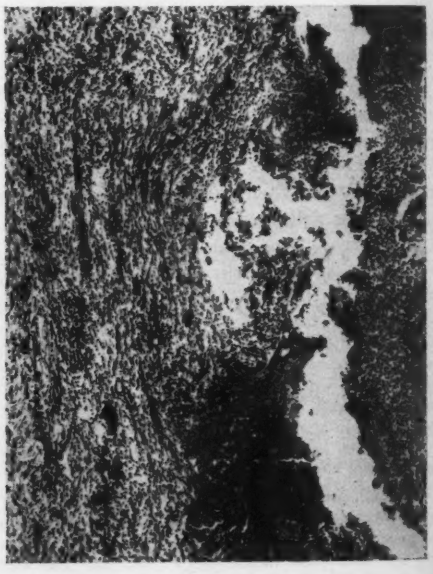

Fig. 2
Photomicrograph (same specimen) showing edge of diverticulum and fibrosis of bowel wall.

between the two conditions is not always possible.

The regime recommended in the past which carried with it a tremendously prolonged period of morbidity has been so unsatisfactory that it has been urged that medical means should be resorted to even more assiduously. This policy would, of course, subject the patient to even greater opportunity for serious and perhaps fatal complications. Compared to many other abdominal conditions of a surgical nature diverticulitis is still sufficiently novel to make it probable that the optimum method of management has not even now been arrived at but it is evident that our methods during the past quarter of a century have not been ideal.

CONCLUSIONS

(1) If the management of diverticulitis is one of the most difficult problems in bowel surgery, more difficult than that of malignant lesions.

(2) Even though diverticulitis does not cause malignant degeneration in the bowel, these two conditions may be coexistent and their differentiation is often impossible.

(3) A method of management which imposes a waiting period of nine to twelve months following the construction of a colostomy for diverticulitis before deciding whether resection is indicated places an unwarranted burden upon the patient and leaves the question of a possible additional lesion unsolved.

(4) With all of the information afforded by proctoscopic examination, roentgenogram and laboratory findings previous to celiotomy, the surgeon should be competent to determine, with the added benefit of minimum exploration of the tumor, whether or not resection is indicated.

(5) If resection is to be done for diverticulitis, the condition of each patient following the colostomy should determine the length of the interval before the lesion is removed.

REFERENCES

1. Mayo, W. J.; Wilson, L. B.; and Giffin, H. Z.: Acquired Diverticulitis of the Large Intestine. Surg., Gyn. and Obst., 5:8, 1907.
2. Rankin, F. W.; and Brown, P. W.: Diverticulitis of the Colon. Surg., Gyn. and Obst., May, 1930, pages 836-837.
3. Rosser, Curtice: The Surgical Management of Diverticulitis. Sou. Med. Jour., 32:1203, 1939.

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DISCUSSION (*Abstract*)

Dr. John C. Burch, Nashville, Tenn.—In most instances I have followed the plan of doing a colostomy proximal to the lesion and then waiting several months for the inflammation to subside. Recently I had the tragic experience of having carried a patient through the resection, who then died with a coronary occlusion on the fifth day after the colostomy was closed. Perhaps if I had followed Doctor Rosser's plan, I would have avoided a fatality.

Dr. Harry E. Bacon, Philadelphia, Pa.—I think it is ridiculous to manufacture a colostomy and leave the diseased bowel intact for the remainder of a patient's natural life. Primary resection, except in the presence of obstruction and perforation with peritonitis, can and is being done in our clinic with a low mortality and low morbidity.

We have not been able to rely to any great extent on Wangensteen suction but prefer some form of enterostomy proximal to the diseased process. In the past, it has been our custom to employ the appendix or cecum as the temporary opening, but more recently, following the suggestion of Wangensteen and Dennis, we have utilized the transverse colon through a Singleton incision. Five cases recently have been done in this fashion.

In approximately 225 cases of malignancy, diverticulitis, and inflammatory stricture of the colon and rectum we have employed one of the non-absorbable sulfonamide drugs, either sulfathalidine or sulfasuxidine and have found it extremely satisfactory.

In the light of our present day pre- and postoperative program, it has seemed to us expedient to institute primary resection and primary anastomosis whenever possible, providing the proximal enterostomy is established at the same sitting.

Dr. Milford O. Rouse, Dallas, Tex.—From the viewpoint of the gastroenterologist, I wish to say that it is quite comfortable to know that colon surgery is available for conditions under discussion, namely, diverticulitis. The responsibility of the internist is to see that he does not wait too long after studying the patient to recommend surgical consultation and surgical procedures with the approval of the surgeon.

Conversely, I believe the medical man can be of definite aid to the surgeon in preparing the patient for actual operation and in the follow-up care of ensuing months.

Dr. Rosser (closing).—I was interested in one of the technics suggested by Dr. Bacon, the construction of a transverse colostomy at the same sitting at which the anastomosis is done.

Recently I had the opportunity to see Dr. Dixon at the Mayo Clinic who, as you know, prefers a primary anastomosis of the rectum, even though the tumor is fairly low, and while in previous years he used to do a colostomy, wait for several months and then resect the tumor and do an end-to-end anastomosis, his cur-

rent practice is to do just what Dr. Bacon mentioned: a primary resection and anastomosis of the colon and "pop out" the transverse colon as a colostomy at the same time. I have also recently seen Wangensteen use the same technic.

ISTHMUS DEFECTS OF THE FIFTH LUMBAR VERTEBRA*

By R. Beverly Raney, M.D.
Durham, North Carolina

The term "isthmus," used occasionally in earlier literature, was advocated by Chandler[1] in 1931 as a descriptive and convenient name for the pars interarticularis or interarticular portion of the vertebral lamina. This area is the narrowest part of the neural arch. An absence of bony continuity at the isthmus, or isthmus defect, may be unilateral or bilateral. When the defect is present on both sides, the vertebra is divided into two separate pieces of bone (*Figs. 1, 2, 3*). The anterior portion is made up of the body, pedicles, transverse processes, and superior articular processes. The posterior portion, often referred to as a separate neural arch, consists of the laminae, the inferior articular processes, and the spinous process. Willis[2] has pointed out that when a bilateral defect is present the bony anchorage of the vertebral column to its base on the sacrum is entirely lost and its stability is altogether dependent upon the ligaments.

The chief significance which has been attributed to the isthmus defect is that it may lead to spondylolisthesis. The term prespondylolisthesis is synonymous with spondylolysis and spondyloschisis in denoting the presence of a bilateral isthmus defect without slipping; its use implies an assumption that the bilateral defect is a precursor of spondylolisthesis. George[3] and Hitchcock[4] have reported cases, demonstrated by roentgenograms, in which prespondylolisthesis proceeded within a few years to frank spondylolisthesis. However, Friberg,[5] who has made a thorough study of this problem, believes that progressive increase of olisthesis in adults rarely occurs.

A second significant role played by the isthmus defect is suggested by the fact that it is found frequently in patients who have low back pain without spondylolisthesis. In 1933, Kleinberg[6] reported 9 cases of disability of the back attributed to prespondylolisthesis. Caldwell[7] believes that low back pain may be caused by the neural arch defect without demonstrable slipping. Ghormley[8] considers spondylolisthesis and spondylolysis of equal significance as causative factors of backache, with or without sciatic pain. Experience with the cases which form the basis of the present report leads to a similar belief that the isthmus defect may constitute an important cause of low back pain in the absence of spondylolisthesis.

INCIDENCE

Another reason for the importance of the isthmus defect is that it is a very common finding. Statistics on incidence are available from two sources: the study of skeletons and the analysis of roentgenograms.

In 1931, Willis[9] reported a separate neural arch in 79 of 1,520 skeletons in the Hamann Museum, an incidence of 5.19 per cent. In this series the isthmus defect occurred more than three times as frequently as the familiar spina bifida. In 61 cases the defect was bilateral, in 16 it occurred on the right side only, and in 2 on the left only. It appeared once in the first lumbar segment, once in the third, four times in the fourth, once in both fourth and fifth, sixty-six times in the fifth, and six times in the sixth lumbar segment. Reports from various parts of the world show a striking similarity in the incidence in different races. Congdon[10] found 10 cases of bilateral separation of the neural arch among 200 skeletons of American aborigines, an incidence of 5 per cent. Shore[11] found isthmus defects in 5 of 82 skeletons of Bantu natives in South Africa, an incidence of 6.09 per cent. Pheasant and Swenson[12] found an unfused neural arch in only 2 of 171 cadavers. Isthmus defects have also been reported in Russians by Turner and Tchirkin,[13] in Japanese by Hasebe,[14] and in Eskimos by Stewart.[15]

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*From the Orthopedic Division, Department of Surgery, Duke Hospital.

Statistics based on roentgenographic analysis are doubtless much less accurate than those derived from anatomical study. George[3] found spondylolisthesis or spondylolysis in 3½ per cent of 3,301 patients who had symptoms referable to the lumbar spine and who were ex-

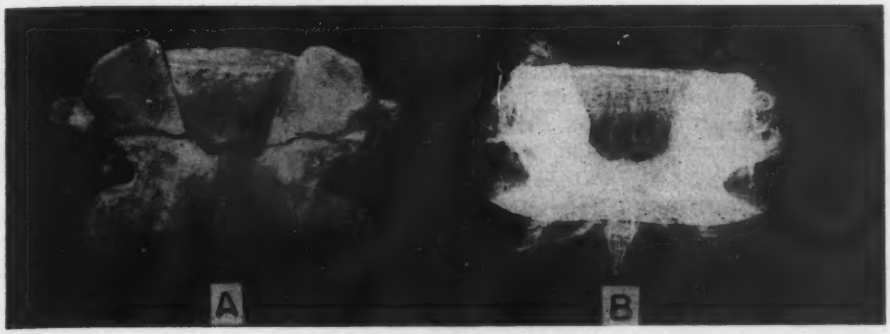

Fig. 1
(A) Posterior view of fifth lumbar vertebra showing bilateral isthmus defects. (B) Anteroposterior roentgenogram of same specimen: the defects cannot be seen distinctly.

Fig. 2
(A) Lateral view of fifth lumbar vertebra showing bilateral isthmus defects. (B) Lateral roentgenogram of same specimen: a part of each defect can be seen.

Fig. 3
(A) Oblique view of fifth lumbar vertebra showing bilateral isthmus defects. (B) Oblique roentgenogram of same specimen: the entire defects can be seen without great difficulty.

amined roentgenographically by anteroposterior, lateral and a single oblique film. Caldwell,[7] using oblique anteroposterior projections in addition to routine films, found neural arch defects in 18.3 per cent of 82 patients with low back pain of orthopedic nature. In February, 1944, Gallucio[16] described the detailed interpretation of oblique films and reported prespondylolisthesis or spondylolisthesis in more than 10 per cent of 142 routine lower spine examinations in soldiers.

Of a series of 300 patients who presented themselves because of low back pain with or without sciatica, we have found isthmus defects, demonstrated in oblique roentgenograms, in 94 cases or 31 per cent. Of these defects, 63 were bilateral; of the 31 unilateral defects, 23 occurred on the left side and 8 on the right. A questionable bilateral defect appeared in 11 cases and a questionable unilateral defect in 5 cases. In 92 of the 94 cases showing definite defects, the last lumbar vertebra was affected, and in 2 of these cases the vertebra just above was involved also. In 2 cases the fourth lumbar vertebra alone was involved; in one of these the defect was bilateral and in the other it appeared only on the left side. The high incidence of isthmus defects in this series may be related to the fact that all of these patients were suffering from low back pain.

PATHOLOGY

The gross appearance of the tissue within the defect is that of fibrous tissue. At operation the posterior portion of a vertebra which has a bilateral defect may be hypermobile; its spinous process, when grasped in a clamp, may be swung through a fairly wide arc. Willis[2] found that in unilateral involvement the defect varied from a mere slit to a gap not more than an eighth of an inch in extent. Willis[9] has also published a photomicrograph of tissue taken from the isthmus defect of a cadaver; he interpreted this as fibrous tissue and found a gradual transition between it and the bone on either side of the defect.

Immediately preceding a lumbosacral arthrodesis in one of our cases, an exploratory flavectomy and removal of part of a defective isthmus for biopsy was carried out by Dr. Robert G. Neill. The specimen included the soft tissue of the defect and a small portion of the bone on either side. Its microscopic appearance (*Figs. 4, 5, 6*) has been described by Dr. I. N. Dubin of the Department of Pathology at Duke Hospital as follows:

"The tissue was seen microscopically as two roughly triangular pieces of bone, with the apices of the triangles pointing toward each other. On one side the bone was cancellous in type and between the bone lamellae there was abundant cellular marrow; this cancellous bone then changed to a very narrow layer of dense bone. On the opposite side the bone was of the dense variety. Both pieces of bone were covered by a rather thin layer of homogenous hyaline cartilage. This cartilage was irregular in thickness and soon faded into an atypical form of hyaline cartilage. The latter was more fibrillar in type and tended to be broken up into narrow bands in which, however, there was an abundance of cartilage cells. These bands became thinner and scarcer as they approached the mid-point of the isthmus and the cartilaginous matrix became more pink-staining and more fibrillar while the cartilage cells decreased in number. Finally in the mid-point, or in the region of the isthmus, the tissue consisted of a few narrow bands of this sort of cartilaginous tissue in which very few but

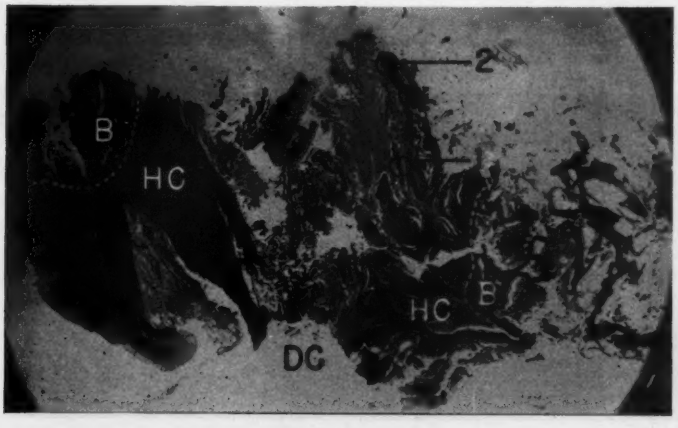

Fig. 4

Low power photomicrograph of biopsy specimen of isthmus defect. B, Bone; HC, Hyaline cartilage; DC, Degenerated fibrillar cartilage. The margins between bone and hyaline cartilage, readily seen under the microscope, are indicated by dotted lines.

definite cartilage cells were still seen. Mixed with these more pink-staining, denser bands of atypical cartilage was a loose areolar pale-staining connective tissue. It was difficult to decide whether this narrow bridge of atypical cartilage in the center represented fibrocartilage or degenerated hyaline cartilage such as has been described as 'asbestos degeneration' of cartilage. Serial sections were made in order to look for bone in the midportion, but no bone was found."

These findings are of interest in connection with hypotheses of the pathogenesis of the isthmus defect.

ETIOLOGY

The cause of isthmus defects has not been established. Of numerous hypotheses, the two outstanding conceptions are that the defect is a congenital anomaly and, alternatively, that it is an ununited fracture possibly sustained in many instances at birth. At present, however, each of these hypotheses is contradicted by some of the evidence. In view of the high incidence of the lesion, it is interesting to reflect that according to the first of these hypotheses the isthmus defect is one of the most frequent developmental anomalies while according to the other it is by far the most common of non-unions.

The assumption of Neugebauer[17] that the isthmus defect results from a developmental failure of fusion of two centers of ossification provides a ready hypothetical explanation. However, microscopic studies of fetal vertebrae have failed to demonstrate two such centers of ossification. On the contrary, as shown by Mall,[18] Chandler,[1] Willis,[9] Hitchcock[4] and others, ossification of each half of the neural arch begins in a single area near the base of the superior articular process, in the region of the isthmus, and proceeds with expansion ventrally into the pedicle and dorsally into the lamina. However, the isthmic zone becomes ossified only slowly, and at birth this region still consists chiefly of cartilage. Contrasting the rarity of a dual center in the embryo with the high incidence of isthmus defects in skeletons, Batts[19] has calculated that the probability that anomalous dual centers alone are responsible for isthmus defects is less than 0.0001 per cent.

Hitchcock[4] found that in stillborn children bilateral fractures of the neural arch could be produced by hyperflexion of the spine without excessive force, and that unilateral fracture could be produced by combining flexion with lateral bending and torsion. Nevertheless, that isthmus defects are simply ununited fractures seems unlikely because of certain pathological considerations. As pointed out by Willis[2] and others, the edges of the defect differ from those of ordinary ununited fractures in showing neither the callus of an attempt at union nor the smooth rounded surfaces of a frank nonunion. Moreover, if the unilateral defect is the

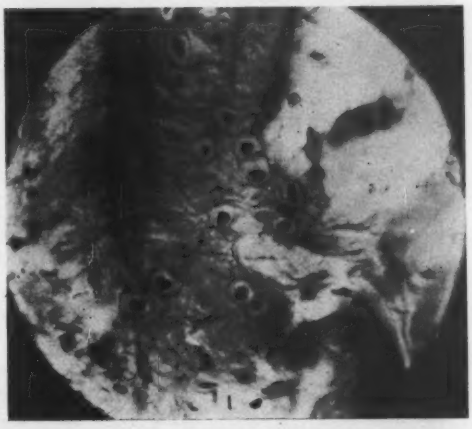

Fig. 5
High power photomicrograph of Area 1 in *Fig. 4*, showing hyaline cartilage.

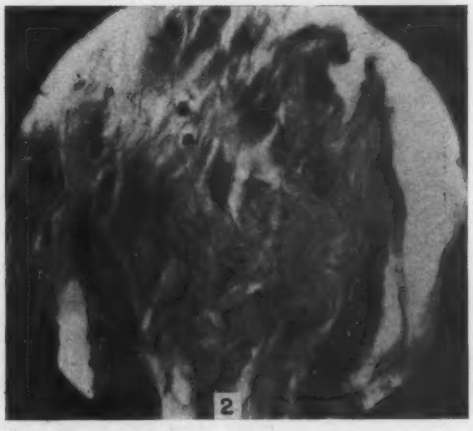

Fig. 6
High power photomicrograph of Area 2 in *Fig. 4*, showing atypical fibrillar cartilage.

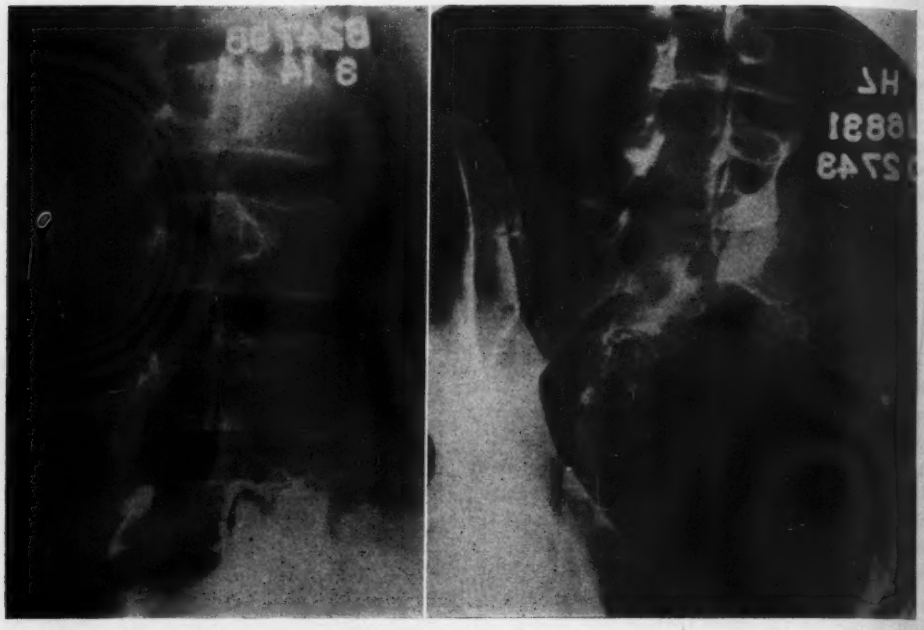

Fig. 7

Unretouched oblique roentgenograms of intact isthmuses, showing how greatly the width of the fifth lumbar isthmus may vary in different individuals.

Fig. 8

(A) Slightly retouched oblique roentgenogram showing a typical defect of a fifth lumbar isthmus. (B) Unretouched oblique roentgenogram showing a questionable defect of a fifth lumbar isthmus.

result of fracture only, its failure to unite is particularly difficult to understand.

In view of the conflicting evidence on pathogenesis, a compromise position is perhaps worthy of consideration. The embryological findings, while showing that bone does cross the isthmus early, are unanimous in demonstrating that this particular region is small and weak and that at

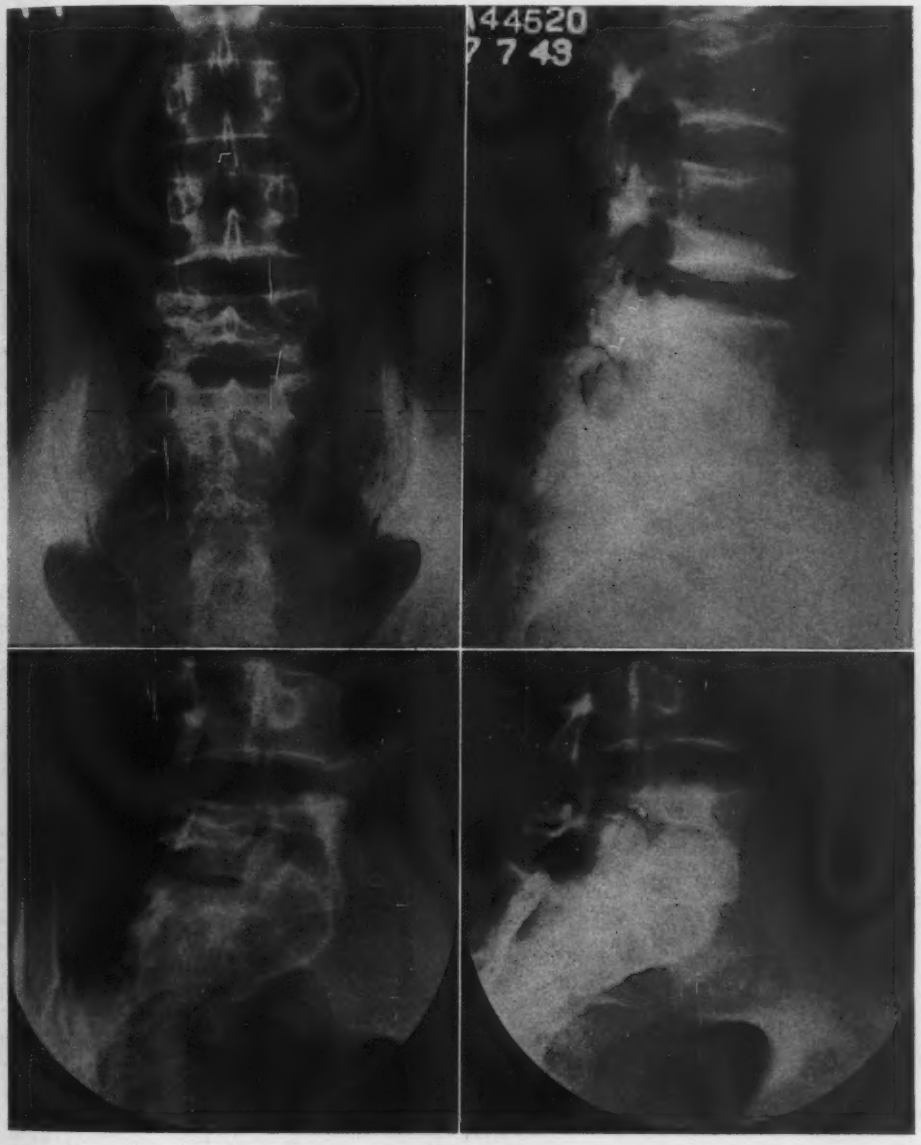

Fig. 9

Roentgenograms of a case of bilateral isthmus defect of the fifth lumbar vertebra. The defects are visible in all projections. The lateral and one of the oblique films have been slightly retouched.

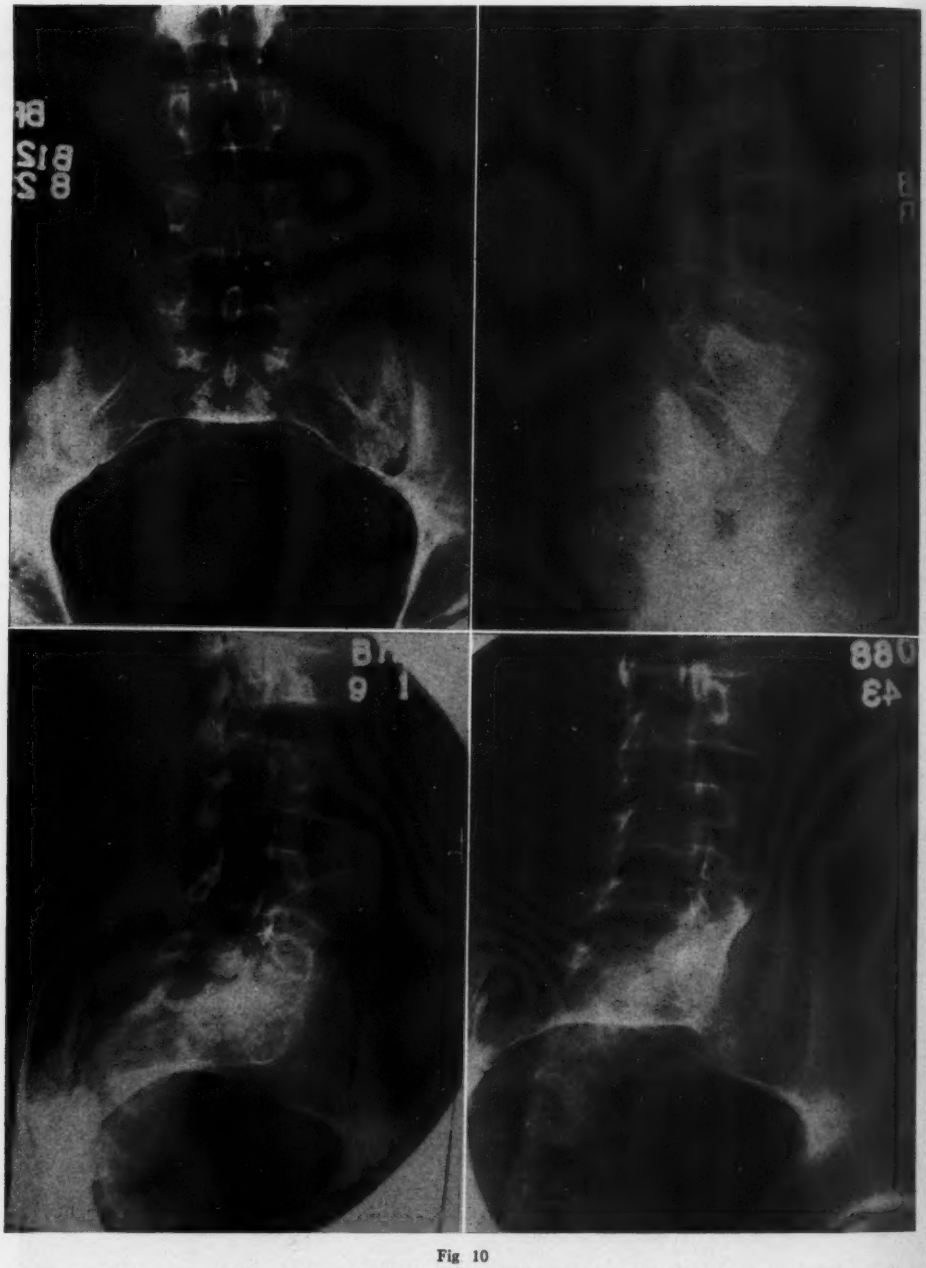

Fig 10

Roentgenograms of a case of bilateral isthmus defect of the fifth lumbar vertebra. The defects are visible in all projections except the anteroposterior. The oblique films have been slightly retouched.

birth it is still largely cartilaginous. It may be that such a structure is fractured frequently at birth and occasionally later. It is possible that mechanical factors would separate the fragments, increasing the probability of non-union. Willis[2] has said:

"The less the area of true bone involved the less would be the attempt at repair," and ". . . a fractured bone tends toward repair while a separated cartilage does not."

SYMPTOMS AND SIGNS

While no detailed clinical analysis of a large series of patients with isthmus defects but without spondylolisthesis has been made, certain generalizations concerning the clinical picture seem warranted.

The symptoms experienced in the presence of isthmus defects are those of mechanical instability at the lumbosacral level. The outstanding complaints are low back pain, weakness and stiffness. These symptoms have usually been present for a considerable period and have been much worse at certain times than at others. A history of trauma may or may not be elicited. The discomfort is likely to be increased by factors which increase mechanical stress at the affected level, such as prolonged weight bearing, active exercise, or work in a stooped position, and likely to be relieved by factors which tend to increase mechanical stability, such as rest or the use of a corset. In addition, involvement of nerves of the lower extremities may be evidenced by radiating pain, usually sciatic in distribution, accompanied at times by areas of numbness and tingling.

Correspondingly common physical signs are abnormal restriction of low back motion by muscle spasm, abnormal limitation of straight leg raising by pain, and tenderness of the low back. In addition, if the nerves to the lower extremities are affected, the physical signs may include decreased reflex responses, localized diminution of cutaneous sensation, and even muscle weakness.

DIAGNOSIS

Since this group of low back and lower extremity symptoms and signs is seen so commonly and in such a large variety of low back abnormalities, the clinical impression of isthmus defect is often approached only after consideration of more familiar entities such as the injured intervertebral disk. Isthmus defects may be found in patients who in addition have other apparent causes for back pain. The diagnosis of isthmus defect is confirmed only when the defect can be demonstrated definitely in roentgenograms or at operation. Hence the roentgenographic examination becomes of the utmost importance and is worthy of more detailed comment. Chandler[1] has said:

"Probably no one factor in the recognition of lesions of the isthmus is more important than suitable roentgenograms of this area."

In our experience, as in that of Morton,[20] Willis,[21] and Gallucio,[16] isthmus defects are best visualized roentgenographically by the oblique projection. The technic was described in 1931 independently by Hubeny[22] and by Meyer-Burgdorff[23] and has been used by Ghormley and Kirklin[24] for demonstrating the articular facets. These films are made with the patient supine but with one side of the body so raised that its transverse axis lies at an angle of approximately 45° to the table and film. In the series of 300 cases referred to previously, defects of the isthmus appeared in the oblique roentgenograms in 94 cases. In only 17 cases, of which 5 showed spondylolisthesis also, were these defects recognizable in the anteroposterior projection, and in only 20 cases, of which 7 showed spondylolisthesis also, were they recognizable in the lateral projection. In none of these cases did the degree of spondylolisthesis exceed the second grade of Meyerding.[25] In 16 cases, or 5 per cent, the oblique roentgenograms suggested isthmus defects but did not show them clearly enough to provide a reliable diagnosis. Many technical factors render the making and reading of oblique films difficult. We believe that with improved roentgenographic technic and increased experience in interpretation, based on combined roentgenographic and anatomical study, the percentage of doubtful cases will be reduced.

TREATMENT

In our opinion the treatment of most patients with isthmus defects without spondylolisthesis

should be conservative. This viewpoint is influenced by the fact that these defects are so common in anatomical material that probably many cases never develop symptoms. Presumably in most cases the symptoms result from a decompensation similar to that described by Ferguson;[26] they are produced by excessive mechanical stresses in the presence of a defect rather than by any irreversible morphological change. If the mechanical status which existed prior to the development of symptoms can be restored, the patient may be cured of his symptoms without correction of the isthmus defect. Common conservative measures directed toward this objective include a firm mattress and fracture board at night, a plaster body jacket or strong fitted corset for ambulatory use, heat and massage of the low back region for the relief of pain, and graded exercises for the improvement of low back posture and muscle strength. Elimination of focal infection has seemed to be helpful in some instances, and large doses of vitamins have usually been employed, particularly of nicotinic acid and thiamine chloride.

When relief from conservative measures has been obtained but is incomplete or only temporary, lumbosacral spinal fusion, providing a permanently strong internal support, has been the treatment of choice.

SUMMARY

Isthmus defects of the fifth lumbar vertebra are common lesions in the causation of which both developmental and traumatic influences probably play a part. Biopsy has shown the soft tissue of the defect to consist of atypical fibrillar cartilage. Oblique roentgenograms, although frequently difficult of exact interpretation, are of great value in facilitating recognition of the lesion and form a useful routine addition to anteroposterior and lateral views. Isthmus defects appear to be an important cause of low back pain. The treatment consists of measures to increase the stability of the low back.

The writer wishes to acknowledge with gratitude the clinical assistance of the other members of the Orthopedic Division of Duke Hospital and the helpful cooperation of the Departments of Radiology, Pathology, and Anatomy.

REFERENCES

1. Chandler, F. A.: Lesions of the "Isthmus" (Pars Interarticularis) of the Laminae of the Lower Lumbar Vertebrae and their Relation to Spondylolisthesis. Surg., Gyn. and Obst., **52**:273-306 (Sept.) 1931.
2. Willis, T. A.: The Lumbosacral Vertebral Column in Man, Its Stability of Form and Function. Am. J. Anat., **32**:95-123 (July) 1923.
3. George, E. M.: Spondylolisthesis. Surg., Gyn. and Obst., **68**:774-781 (Apr.) 1939.
4. Hitchcock, H. H.: Spondylolisthesis, Observations on Its Development, Progression, and Genesis. J. Bone and Joint Surg., **22**:1-16 (Jan.) 1940.
5. Friberg, S.: Studies on Spondylolisthesis. Acta Chirurg. Scandinav., **82**: Supplement 55, 1939.
6. Kleinberg, S.: Prespondylolisthesis, Its Roentgenographic Appearance and Clinical Significance. J. Bone and Joint Surg., **15**:872-881 (Oct.) 1933.
7. Caldwell, G. A.: Spondylolisthesis, Analysis of Fifty-Nine Consecutive Cases. Ann. Surg., **119**:485-497 (Apr.) 1944.
8. Ghormley, R. K.: Backache, Examination and Differential Diagnosis. J.A.M.A., **125**:412-416 (June 10) 1944.
9. Willis, T. A.: The Separate Neural Arch. J. Bone and Joint Surg., **13**:709-721 (Oct.) 1931.
10. Congdon, R. T.: Spondylolisthesis and Vertebral Anomalies in Skeletons of American Aborigines with Clinical Notes on Spondylolisthesis. J. Bone and Joint Surg., **14**:511-524 (July) 1932.
11. Shore, L. R.: Abnormalities of the Vertebral Column in a Series of Skeletons of Bantu Natives of South Africa. J. Anat., **64**:206-238 (Jan.) 1930.
12. Pheasant, H. C.; and Swenson, P. C.: The Lumbosacral Region, A Correlation of the Roentgenographic and Anatomical Observations. J. Bone and Joint Surg., **24**:299-306 (Apr.) 1942.
13. Turner, H.; and Tchirkin, N.: Spondylolisthesis. J. Bone and Joint Surg., **7**:763-786 (Oct.) 1925.
14. Hasebe, K.: Die Wirbelsaule der Japaner. Ztschr. f. Morphol. u. Anthropol., **15**:259-380, 1913.
15. Stewart, T. D.: Incidence of Separate Neural Arch in the Lumbar Vertebrae of Eskimos. Am. J. Phys. Anthropol., **16**:51-62 (July-Sept.) 1931.
16. Gallucio, A. C.: Spondylolisthesis: A General Consideration with Emphasis on Radiologic Aspects. Radiology, **42**:143-158 (Feb.) 1944.
17. Neugebauer, F. L.: Spondylolisthese et Spondylolizeme. Paris, 1892.
18. Mall, F. P.: On Ossification Centers in Human Embryos Less Than One Hundred Days Old. Am. J. Anat., **5**:433-458 (Sept.) 1906.
19. Batts, M., Jr.: The Etiology of Spondylolisthesis. J. Bone and Joint Surg., **21**:879-884 (Oct.) 1939.
20. Morton, S. A.: The Differential Diagnosis of Traumatic Lesions of the Spine. Radiology, **41**:560-564 (Dec.) 1943.
21. Willis, T. A.: Structure and Development of the Spine. J.A.M.A., **126**:407-412 (June 10) 1944.
22. Hubeny, M. J.: The Oblique Projection in Examination of the Lumbar Spine. Radiology, **16**:720-724 (May) 1931.
23. Meyer-Burgdorff, H.: Untersuchungen uber das Wirbelgleiten, Georg. Thieme, Leipzig, 1931.
24. Ghormley, R. K.; and Kirklin, B. R.: The Oblique View for Demonstration of the Articular Facets in Lumbosacral Backache and Sciatic Pain. Am. J. Roentgenol., **31**:173-176 (Feb.) 1934.
25. Meyerding, H. W.: Spondylolisthesis as an Etiologic Factor in Backache. J.A.M.A., **111**:1971-1976 (Nov. 26) 1938.
26. Ferguson, A. B.: The Clinical and Roentgenographic Interpretation of Lumbosacral Anomalies. Radiology, **22**:548-558 (May) 1934.

DISCUSSION (*Abstract*)

Dr. Frank D. Dickson, Kansas City, Mo.—This discission on isthmus defects is a very timely one when protrusion of an intervertebral disc has become such a popular diagnosis that it bids fair to supplant all other conditions as a cause for low back pain. Today there seems to be considerable difficulty in getting serious attention when discussing any cause for pain in the lower back other than a protruded disc. I am, however, firmly of the opinion that insta-

bility of the lumbosacral region is still by far the most common cause of low back pain. Of 83 cases operated upon for low back pain in our clinic from September 15, 1941, to September 15, 1944, 69.8 per cent were due to faulty architecture in the lumbosacral region, and 30.2 per cent were due to protruded disc. Of these cases with 69 per cent of defective architecture, 43 per cent were defects in the isthmus of the fifth lumbar vertebra, of which only 8.6 per cent had a spondylolisthesis. This indicates that defects of the isthmus of the fifth lumbar vertebra, and, as Dr. Raney has said, sometimes of the fourth and even of the third lumbar vertebra, in our experience, have been the most common architectural defects encountered.

There is nothing I can add to Dr. Raney's discussion of the etiology. We just do not know the cause. Personally it seems to me that a fault in the germ plasm is the most logical explanation of this defect. The pathology Dr. Raney has very thoroughly covered.

In considering the diagnosis, there are certain facts which might well be emphasized. The history is most enlightening. In practically 100 per cent of all cases, 35 years old or older, and most of the cases seem to fall in this age group, a careful history will disclose that for many years the patient has had back symptoms, or at least has been conscious of his back. Such a history of prolonged back discomfort suggests a very careful search for faulty architecture causing an unstable back. Almost always an acute attack of back discomfort is brought on by a lifting strain or some form of trauma, particularly falling and landing on the buttocks. The attacks usually become more frequent and more lasting as time goes on, and finally reach the stage where the discomfort is more or less constant. During an acute attack the limitation of back movement is marked, and there is nearly always extensive unilateral muscle spasm; between the attacks, however, there is surprisingly little limitation of motion except on the extremes of forward bending or hyperextension. The absence of limitation of movement between attacks should not lead one astray. I agree with Dr. Raney that a not inconsiderable number of isthmus defects are associated with pain over the sciatic distribution and even muscle weakness in some. Limited straight leg raising has not been an outstanding sign in our cases. We find it far more frequently with protruded disc.

It is in regard to the roentgenological examination that I am going to disagree somewhat with Dr. Raney, who places his main reliance on oblique projections of the spine. Our greatest reliance is placed on lateral views of the lumbosacral region, coned down to include only the last three lumbar vertebrae and the sacrum and taken in two positions, one with the spine in acute flexion and one with it in extreme extension. Almost invariably in our experience one or the other of these two views will open the cleft so that it becomes clearly visible. The view taken in flexion most usually opens up the cleft while those in extension usually close it but not always. Yesterday before I left town I had a case in which the spine was perfectly normal in flexion, but extension opened up a line of failure of fusion so wide that you could almost have driven a cart through it. Oblique views are frequently taken if the lateral views described are suggestive, but they practically never disclose a defect not seen in the lateral views and in most cases the defect is not nearly so clearly visible as in the lateral views. I recommend these views to you for your consideration.

Dr. Raney did not discuss treatment, but I might say that I have read his paper and he advocates conservative treatment primarily with operative treatment where it is indicated. This position is sound in young individuals and in most women, but in our experience over the last ten years, including some thousands of backs, we have never seen complete or even satisfactory relief secured by conservative treatment in an individual over 30 years of age unless a fusion operation has been performed. Then in our experience relief is gained in about 97 per cent of the cases. Rarely after fusion is it impossible for the individual to resume normal activity and even hard manual labor. With any degree of spondylolisthesis and a symptom-producing back, we believe that fusion is mandatory.

Dr. F. W. Carruthers, Little Rock, Ark.—I want to emphasize the fact that there are other conditions than so-called intervertebral disc that will produce pain in the back. There has been much in the literature of late to the effect that all a man has to do to have intervertebral disc is to cough and sneeze and have a pain in his back. Congenital defect on many occasions can be the cause for backache, and it should not be passed by. If we visualize the back in a broader sense than simply trying to look for an intervertebral disc, I believe that we will be able in instances to find the real cause for the backaches.

Dr. J. Albert Key, St. Louis, Mo.—The fact that an individual has a spondylolisthesis or a spondyloschesis is no evidence that the patient hasn't also a lesion of the intervertebral disc. Dr. Dickson's last picture showed x-ray evidence of a lesion of the disc and I think that patient's pain was due to the lesion of the disc. The pain in most cases of spondylolisthesis arises from within the spine and is not due to the so-called instability of the low back, but is due to the fact that either before or after this vertebra slips forward the disc is deranged and irritates the nerve root. I do not mean that you should not fuse these cases. I cannot fuse them and get 95 per cent of mine back to manual labor. Sometimes I have to go in later and take the disc out.

Dr. H. R. McCarroll, St. Louis, Mo.—There is a very practical point that I do not think has been brought out in the discussion thus far. As Dr. Albert Key has said, the presence of a pedicle defect does not rule out a lesion of the intervertebral disc. It is often impossible to decide preoperatively which of the two lesions may be the causative factor. Because of

this, we should never fuse these backs without also exploring the intervertebral space or spaces in question. This adds no more than ten or fifteen minutes to the operative time, and if a lesion is demonstrated or if it appears questionable, the disc is removed. This is then followed by an adequate fusion, as I feel 100 per cent of these backs should be fused. May I qualify this, by stating that I refer only to those patients who cannot be controlled conservatively, and those who have sufficient pain to justify surgery.

Dr. Raney (closing)—I quite agree with Dr. Key that the presence of a defect in the x-ray does not mean that the defect is necessarily the cause of the patient's pain. Other causes of back pain may be present. It might be interesting in connection with the subsequent discussions to say that we knew that the patient from whom the biopsy was taken had bilateral isthmus defects of the fifth lumbar vertebra, and we thought that he might have a ruptured intervertebral disc also. He had left-sided signs and symptoms which to a large extent may go with either lesion. In this case, however, an exploratory flavectomy at the left fourth and left fifth lumbar interspaces failed to reveal any abnormality of the intervertebral discs.

EVALUATION OF TREATMENTS IN THROMBOANGIITIS OBLITERANS*

(BUERGER'S DISEASE)

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The definition of thromboangiitis obliterans, or Buerger's disease, as given in Osler's Principles and Practice of Medicine,[1] seems to provide the correct approach to this insidious, peripheral, vascular disease, particularly of the young male. It is an acute inflammatory lesion with occlusion thrombosis probably due to infection.

The disease was first identified by Von Winiwarter in 1879. Its present name was given it by Buerger[2] in 1908, who exhaustively studied its clinical and pathological aspects. Very little has been added to this clinico-pathological picture and its cause is unknown.

There are numerous theories as to the cause such as tobacco, mentioned by Buerger and Silbert.[3] Others such as Harkavy[4] and his coworkers place the effect of tobacco on an allergic basis. It is generally agreed that tobacco has a definite aggravating reaction in thromboangiitis obliterans; however, the same is true to some extent in other types of peripheral vascular disease. The general reaction of the vascular system to tobacco is a constriction or vasospasm. Maddock and Coller[5] have very definitely proven that hypersensitivity to tobacco is not a factor in thromboangiitis obliterans, and their allergy tests did not confirm reports of increased sensitivity to tobacco. Theis, Freeland[6] and Barcroft[7] have thrown new light on the physiologic reaction to smoking in thromboangiitis obliterans. They attribute this reaction to tobacco to its causing a deficient oxygenation of the arterial blood. They find there is a greater reduction in the oxygenation of arterial blood in the patient with thromboangiitis obliterans than in other blood vessel diseases or normal individuals. They have also proven there is an increased viscosity and other changes in the blood which may be evidence of disturbed tissue metabolism. Failure of physiologic adjustment to compensate for the lowered oxygen tension may be an etiologic factor in thromboangiitis obliterans. Therefore, all the recent contributions are quantitative measurements, of blood flow to various parts, or blood components which do give more exact understanding of the influence of different factors upon the diminished blood flow and methods for treatment.

Buerger and Lewis[8] have proven the pathology in the vessels is characteristic. The occlusive lesion is a thrombotic one affecting arteries as well as veins, primarily of the extremities independent of arteriosclerosis. The media is uncalcified, the intima shows no atheroma, but is invaded within a relatively intact main elastica by great masses of organized tissue, permeated by small vascular channels. This new tissue floods the artery, or fills a large part of the lumen so that what blood circulates passes through small crevices. The new tissue is sometimes quite clearly blood clot in a state of fresh or more advanced organization; at other times it may be interpreted as proliferated intimal tissue. In many arterial sections it is obvious that the new substance has been laid down in

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successive layers at wide intervals of time. The walls of these arteries display evidences of chronic inflammation with development of fibrotic tissue in the adventitia that binds together the artery, vein, nerve and other structures. The extent to which the lumen of the artery is invaded varies much at different levels. It is often spoken of as segmental involvement. The affection of the arteries in advanced cases is remarkable for its extensiveness involving the main artery and all its branches throughout the leg. It is the rule for the arteries of both legs to be involved though to different extents. The arteries of the arm are frequently affected, too, but generally in less degree. There is no other disease which brings such universal ruin to the large and small arteries of the limb, and there is none in which the extent of vascular obliteration is so disproportionate to the symptoms, or in which obliteration of all the chief arteries of a leg may persist for many years without gangrene of toes threatening. This is due to the gradualness of the process and to the development of an extraordinary meshwork of impalpably small arterial anastomosis in which the blood now flows throughout the length of the limb. Another feature of this disease is the frequence with which the veins of the legs show isolated or migrating thrombi with subsequent obliteration of their channels. The disease is generally believed to be one that primarily attacks and damages the vessel wall, leading through inflammation to secondary thrombosis and occlusion.

The location of the disease is primarily in the lower and upper extremities, but has also been demonstrated in spermatic vessels, renal vessels, mesenteric vessels and cerebral vessels.

In the study of thromboangiitis obliterans one encounters all the signs and symptoms that are found in all the various other peripheral vascular diseases. The pathology and location we have mentioned; now briefly to enumerate the symptoms. Pain which brings the patient's attention to his extremities and in turn to the physician may be due to intermittent claudication, migratory phlebitis in superficial vessels, changing position of extremity, ischemia, chronic cyanosis, erythromelia, trophic lesions, infection and gangrene. The patient may become neurotic, or have definite mental depression from this pain. He may often be seen with a haggard look, staring eyes, trunk bent with arms clasping and embracing the knee and leg of the affected part, or the foot is held tenaciously, the sole or dorsum rubbed and stroked in fruitless attempts to lessen the intensity of the pain. The ischemia is due either to mechanical blockage of vessels or to a vasomotor reaction. The cyanosis is brought about by venous obstruction, diminution of arterial *vis a tergo* or vasomotor influence. Intermittent claudication is a constant feature of this disease. Coldness is vasomotor and mechanical. The change and absence of arterial pulsation is the most reliable sign. Migrating phlebitis of the superficial veins is present in 30 to 40 per cent of cases. The diagnosis is not difficult if several of the typical symptoms or signs occur in a young male. The greatest difficulty is in the middle age arteriosclerotic group. A histopathological section of the vessel will not only help diagnose thromboangiitis obliterans but also determine its stage.

The outlook under present day therapy is very much brighter than a generation ago. The treatment has been divided into prophylactic, conservative and operative. There may be an overlapping of these methods.

The prophylactic treatment as suggested by Buerger would be used in susceptible people if that could be determined. Elimination of certain predisposing forces as excessive exercise, exposure, certain foods and tobacco is necessary. There is as yet no known serum or medicament. After diagnosis of obstructive vascular lesions even before destruction in peripheral tissues the functional demands on the local circulation must be diminished. Prolonged standing, walking, compressing forces (tight shoes, bandages), exposure to cold or mechanical insults (clean wounds or infections) must be carefully avoided.

Conservative treatment at present offers the best approach in thromboangiitis obliterans. Under this group we find local hygienic care, bed rest, prescribed exercises, baths, heat, sympathetic blocks, fever therapy, passive vascular exercising apparatus, intravenous saline, internal medications (antispasmodics), intermittent venous occlusion apparatus, mecholyl iontophoresis

and some newer methods which are being studied such as penicillin and ultraviolet blood irradiation.

The operative treatment may be divided into local minor surgery, major surgery and sympathetic surgery. Minor surgery and sympathetic surgery are used as an adjunct to conservative therapy, and if all fails and we have overwhelming tissue destruction, then major surgery (leg or thigh amputations) is necessary. By local minor surgery is meant the removal of nails in infected beds, incision of localized enclosed suppuration, amputation of all or part of severely infected digits, and peripheral nerve crushing. Sympathetic surgery is quite limited in thromboangiitis obliterans, and, as stated by DeTakats,[9] one thing is certain: sympathectomy does not modify the course of this disease. The patient who is a candidate for a sympathectomy must demonstrate the presence of an adequate collateral vascular bed and must show that he is in a quiescent stage of the disease, in a state of remission, nor should the disease show too much visceral extension.

I wish to return to the conservative therapy for more detail and offer as a tried and proven valuable adjunct in a very limited number of cases the use of artificial fever therapy by cabinet or by electromagnetic cable. Bed rest is essential until acute symptoms subside. The abstinence from tobacco must be positive. I do not believe that tobacco causes this disease, but the patient will never get well regardless of therapy while he continues smoking, and if cured is sure to have a recurrence when smoking is resumed. In the cases to be presented, this is definitely noted in their history. Ethyl alcohol stands foremost of the drugs producing vasodilatation to increase peripheral blood flow. It should be used as a dilute palatable drink by mouth three or four times daily in amount sufficient to produce noticeable vasodilatation or a feeling of well-being. If alcohol is not tolerated, such drugs as nitroglycerine, tissue extracts or papaverine may be used, and of these papaverine seems best. For best and prompt reaction, it should be given intravenously: one grain every hour until response, then every four hours until the emergency has subsided. The use of intravenous saline has not proven of sufficient value in most clinics to be further considered. Assuming the cause of thromboangiitis obliterans to be infectious, we may hope to expect benefit with penicillin, as has been the case with sulfonamide therapy in the rapidly spreading streptococcal infection usually characterized by lymphangitis. Blocking the regional sympathetics[10] with procaine is primarily a diagnostic procedure to demonstrate an adequate collateral vascular bed, but may also be considered an emergency measure in tiding the patient over an extreme state of vasospasm. Exercises of the Buerger-Allen type modified by Wright[11] are indicated in all cases. Baths should be limited to compresses of saline or boric acid if ulceration and infection are present for 30 minutes twice a day. For mild cases, some of the advertised warm mineral baths are beneficial, but similar results can be obtained in a bathtub or whirlpool bath. Water will macerate poorly nourished tissues and open avenues of infection. The compresses are used to soften crust and prevent backing up of serum or pus. The passive vascular exercising apparatuses are of value only when the predominant findings prove to be organic occlusion and the vasomotor have been eliminated, as they increase blood flow through relatively rigid arteries by rhythmically increasing intra-arterial pressure or decreasing the pressure within the ischemic tissue. Ultraviolet blood irradiation[12] brings some promise, but further investigation is necessary. Heat is very helpful in all cases, but its proper application is essential. The affected extremities should be exposed to none other than room temperature or below. A beneficial reflex vasodilatation by immersing opposite extremities in water at 113° F. may be accomplished. Local heat to the trunk by means of blankets, hot water bottles, electric pads, or heated cradles, is to be encouraged, which also accomplishes vasodilatation. Intravenous typhoid[11] and now specific protein injections have proven very beneficial in the treatment of thromboangiitis obliterans. The intravenous typhoid administration is more widely accepted, as it is available in all parts of the country, and doing a good job. Its action is not specific, probably depending purely upon vasodilatation of the available functioning main and collateral vessels supplying the limb. The

results, however, have not been entirely satisfactory, nor is the procedure entirely without possible accidents. Using the desired results of the typhoid vaccine treatment as a criterion for the proper treatment of thromboangiitis obliterans, I have used the fever cabinet. A patient covered with blankets and electro-magnetic cable with affected extremities exposed can expect the same result except be a little more uncomfortable because of weight on his trunk. Snow[13] has outlined the limitations of fever therapy as follows: the most definite use of fever therapy is when it is instituted for direct thermal effect on a micro-organism which can be heat-killed. The next indication for its use is in certain diseases where the disease-resisting mechanism is stimulated and so, indirectly, invading micro-organisms are adversely influenced. Third, there are certain conditions in which fever therapy is utilized where increased blood flow, dilatation of vessels, increased capillary bed, produce direct circulatory effects.

The nine cases that follow represent a group of thromboangiitis obliterans that have had previous treatment of one type or another with recurrence. The cases are all men and have had complete peripheral vascular examinations by the referring physicians and myself. Some have been treated in other neurocirculatory clinics. Six others have had this treatment who were diagnosed early in their disease and have made uneventful recovery. Of the nine in whom the majority had evidence of gangrene, two have died and two have had recurrences. The other five have had remissions as long as five years doing their usual work. Only one patient required major surgery and he died. The other death was sudden in striking the patient, who had been symptom-free, by severe abdominal pain. He died in two hours. The two recurrences were the men who thought starting to smoke again after they were symptom-free would not matter. In the beginning with this treatment the patient was subjected to a 6-8-hour plateau fever of 103°, but now only 2-3-hour plateau fever 103° is given. The treatment as the patient's symptoms subside becomes ambulatory. One or two treatments a week are given, and if the stage is very acute, every other day. The cabinet in use has had a special door put in it to allow the affected extremity to protrude and be cooled at will. Before the access to this door many of the patients developed annoying blisters.

Using fever therapy, the patient becomes pain-free after 10-12 hours of 103° fever unless a very deeply ulcerated infected wound complicates the case. There is an immediate loss of edema, the fever is easily controlled, all patients, as the acute stage subsides, become ambulatory and, as they further improve, return to work between treatments.

CASE REPORTS

Case 1.—A. L., 1939, a white man, aged 25, complained chiefly of pain in the fingertips, with development of sores. About three and a half years previously the patient had a swelling upon the left forearm, inflammatory in type and treated unsuccessfully, finally clearing by itself.

He had phlebitis in the left leg, noticed about three years earlier. He was kept in bed for one month with no especial relief.

Ulcer then developed upon the right index finger. He was treated for paronychia by a dermatologist. His fingers have changed. The nails atrophied on several fingers since July, 1938. The patient had a single ulcer on the left big toe for the previous five months. There was also a burning, sandpaper feeling on the bottom of the feet, contracture of the arches of the feet and cramping in the calves of the legs, which had been present for a year. Color change in the legs had been noticed since July, 1937, brought to the patient's attention by a physician.

His general health had been good except for the development of small migrating phlebitis during the previous year. These lesions last but a few hours (1 to 12).

The patient says that he had smoked about 30 cigarettes a day for the previous 10-11 years. He quit in 1937. He was not smoking at the time of examination.

His history was negative for any associated condition. His only operation was a tonsillectomy in 1929. On examination the head, chest, heart and abdomen were negative. Both hands had diminished radial pulse. They were warm except at the tips, where they were always cold in any position. When dependent they were deep red and congested, and when held up they became a slight pink. The right index finger showed sclerotic changes as did three-fourths of the left hand. All tips were enlarged, shiny and appeared abnormal and waxy.

There was a small ulcer on the left big toe. The dorsalis pedis artery was most difficult to palpate. It was small and weak. The toes were cold. When dependent they were congested but not painful. When up they were a slight pink. There was no typical blanching.

There was a small area of phlebitis upon the bottom of both feet and upon the fourth right finger on the dorsal surface.

Urine examination was negative. The blood was essentially normal.

This patient has had every conceivable treatment for peripheral vascular diseases: suction pressure, exercises, rest, bed, hypertonic saline, tissue extracts, and intravenous typhoid injections. In spite of these treatments, areas of gangrene developed, with partial loss of some of the digits. Sedatives did not control pain and peripheral nerve crushing was done. This patient has been in the cabinet 64 times and has received a total of 292 hours of 103° fever. He is completely healed and is back at work. He was able to dance, and besides his day's work for the government sold jewelry at night. He gained 25 pounds. In 1941 he started to smoke and had recurrence. He had more minor surgery, and now obtained work in a warmer climate. I suspect that he still smokes, so will have recurrences.

Case 2.—J. R., 1939, a white man, aged 43, complained of (1) pain in the left foot, (2) two lesions of the left toes and (3) coldness of the left foot.

For the previous two years the patient has had pain in the left foot when walking any distance and the left foot seems to get colder in the winter than the right foot. The patient believed he had fallen arches which caused him pain. He had noticed numbness of the toes of both feet, especially the left. When he walked two-three blocks his lower legs and feet became weak and ached dully so that he must rest for a few minutes before continuing. About two weeks before examination the patient began to notice a sore discolored spot on the left small toe, which continued to be painful. He had begun wearing a new pair of shoes and noticed this lesion soon after. One week earlier, the left third toe became sore and ulcerated.

Examination revealed head, chest, abdomen and genitals negative. The extremities were well formed. No arterial pulsation was palpable in either foot. The third and fifth toes were swollen and tender. The fifth had a bluish discoloration of the terminal one-half inch and edema and redness of the remainder of the toe. There is a 1 cm. eschar black in color on the medial surface of the terminal fifth toe. The third toe had an eschar on the medial surface of the toenail with pus exuding. There was a putrid odor to the toes of the left foot. There were four or five large pigmented areas in the skin on the posterior surface of the lower one-third of the left leg from old ulcers. At times the left foot was definitely cooler than the right one. For the two months before the onset of the foot ulcers, the patient had had three or four drinks of hard liquor every week, but none in the previous two weeks. Pavex boot treatments were given twice weekly. He had not smoked for the previous two weeks, but before that smoked three or four packages of cigarettes daily. Urinalysis was negative.

The patient had the usual treatments without results. He became worse at the time of treatment. He was in the fever cabinet 10 times, receiving 60 hours of 103° fever. He is a salesman back at work now, feeling well.

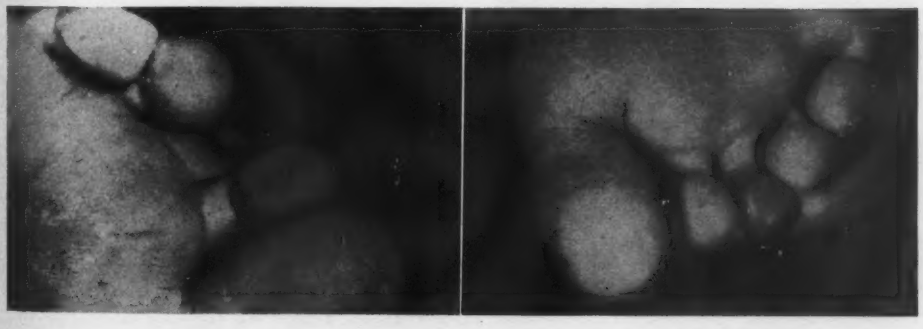
Case 1
Hand and foot before and after fever therapy.

In 1942, he started smoking and had a recurrence. He entered the hospital, but objected to fever therapy. He took two bouts and received intravenous tetrathione. He is again healed.

Case 3.—H. S., a white man, aged 38, in 1939 complained of severe pain in both feet. He was unable to work or be on his feet. His illness began five years before with tingling, aching and coldness of both feet, and his condition was diagnosed as Buerger's disease. Since then he had been treated with Pavex, Buerger's exercise and massage. Now he can walk only from 50-100 feet without getting spasms of the vessels of the feet and having to stop. He complains of nervousness. His feet were frozen in the winter of 1918-19 in Rockfort, Illinois, and his trouble began in 1934-35. He used to smoke 40-45 cigarettes daily. Now he has stopped smoking, but once in a while "sneaks a smoke."

Examination revealed heart, lungs and abdomen negative. The skin was cool over the feet. There were no dorsalis pedis pulsations, and ulcers were seen on

Case 4
Hand and foot before and after fever therapy.



Case 8
Foot before and after fever therapy.

the third toe of the right foot. Urinalysis was negative. Again this patient received suction pressure, tissue extracts, intravenous typhoid before artificial fever with the same results. He became a nervous wreck. He has been in the fever cabinet 31 times, receiving 138 hours of 103° fever. He is back at work as an artist with no pain and has gained 30 pounds.

Case 4.—E. S., a white man, aged 39, in 1939 complained of severe pain in the right great toe. His illness began about one and one-half months before with pain in the great toe which gradually became black. It was extremely painful to the extent of hindering sleep. There had been pain on the bottoms of the feet for the previous four years while walking, especially on concrete. There was migratory phlebitis about two years before. There had been no previous attacks of gangrene. He had had tonsillectomy and adenoidectomy in 1935. Review of his systems was essentially negative. Examination revealed head, heart, lungs and abdomen negative. Dorsalis pedis pulse was very faint in either foot. Both extremities were cool. Touch and pain sense were unimpaired. The great toe and little toe on the right foot were gangrenous. There was a deformity of the tip of the index finger from an infection which was treated by another doctor for eight months. Urinalysis was negative.

The patient was seen by an orthopedist, who recognized vascular trouble and advised suction pressure. The toe became completely gangrenous under this treatment. He also had hypertonic saline without help. He was in the fever cabinet 12 times, receiving 72 hours of 103° fever. The two gangrenous toes were removed at the end of the tenth treatment. He is a lawyer for the government, completely well, does not restrict his exercise, and has gained 40 pounds.

Case 5.—R. P., a man of 60 with peripheral vascular trouble, was in the fever cabinet twice, receiving 10 hours of 103° fever. He developed blisters on several toes which became infected and mid-thigh amputation was necessary. He died in the hospital. Had these extremities been kept out of cabinet it is possible this result would not have happened.

Case 6.—W. D., aged 31, in 1941 complained of hemorrhage on the leg and pain in the calf of the right leg, noticed when awakened. He also had repeated migrating phlebitis. He was in the fever cabinet four times, receiving 12 hours of 103° fever. Swelling and pain subsided in five days, and the patient was allowed activity. There is some activity of the disease still in evidence, as he has had a recent area of phlebitis on the abdominal wall. I feel that this patient had inadequate treatment, but he has had no recurrence.

Case 7.—C. L., a laborer, aged 31, in 1941 complained of pain and small areas of swelling in both hands. On exercise he had noticed pain in both calves. He received only artificial fever therapy. He was in the fever cabinet seven times, receiving 56 hours of 103° fever. He is completely cured.

Case 8.—W. M., aged 34, in 1941 had had Buerger's disease since 1934. He had had treatment at different places at intervals. The great toe of the left foot had been amputated. It had been several years since he had had any trouble. The patient believed this attack was brought on by the fact that he started smoking again and that he had been going at a very rapid pace all summer and had not taken care of himself.

The third toe on the right foot was discolored and beginning to peel. He had had severe pain in the toe and ball of the foot, which was relieved by the use of intermittent venous occlusion apparatus.

This patient was in the fever cabinet 19 times, receiving 57 hours of 103° fever. The gangrene of the toe did not progress after treatment was started, as had been his previous experience with the other foot where the great toe had been amputated several years before. I have just received information that this patient had an attack of acute abdominal pain and was dead in two hours. This happened several months after we had discharged him as cured.

Case 9.—A. E., a printer, in 1942 complained of ulcers on both legs with swelling. About six years earlier, following pneumonia, he developed phlebitis in both lower extremities. The usual care of rest in bed, ice and elevation was used. He recovered sufficiently to return to work, after which an ulcer developed on the medial aspect of each lower extremity in the region of the ankle. The patient was unable to continue his work and ulcers continued to be present in spite of all treatments. He had received exercises, rest, suction pressure, Unna boots, tissue extracts, mecholyl iontophoresis, and intravenous typhoid all to no avail. He has been in the fever cabinet 51 times, receiving 213 hours of 103° fever. His ulcers are entirely healed. He is a possible case of thrombocytopemia.

SUMMARY

I have listed the various treatments used and tried to point out the most valuable in the treatment of thromboangiitis obliterans. In addition, I have found fever therapy a valuable adjunct and have expectations of help with ultraviolet blood irradiation.

BIBLIOGRAPHY

1. McCrae, Thomas: Osler's Principles and Practice of Medicine. New York: D. Appleton and Co., 1927.
2. Buerger, Leo: Circulatory Disturbances of the Extremities. Philadelphia: W. B. Saunders Co., 1924.
3. Silbert, S.: Thrombo-Angiitis Obliterans (Buerger): Treatment of Hundred and Twenty-Four Cases by Repeated Intravenous Injections of Hypertonic Salt Solution; Experience of Ten Years. Surg., Gynec. & Obst., **61**:214 (Aug.) 1935.
4. Harkavy, J.; Hebald, S.; and Silbert, S.: Tobacco Sensitiveness in Thrombo-Angiitis Obliterans. Proc. Soc. Exper. Biol. & Med., **30**:104 (Oct.) 1932.
5. Maddock, M. G.; and Coller, F. A.: Peripheral Vasoconstriction by Tobacco and Its Relation to Thrombo-Angiitis Obliterans. Ann. Surg., **89**:70-81 (July) 1933.
6. Theis, Frank V.; and Freeland, M. R.: Smoking and Thrombo-Angiitis Obliterans. Ann. Surg., **113**:411 (March) 1941.
7. Barcroft, Joseph: The Respiratory Function of the Blood, Part I. Lessons from High Altitudes. Cambridge University Press, 1925.

8. Lewis, Sir Thomas: Vascular Disorders of the Limbs. New York: Macmillan Co., 1936.
9. DeTakats, Geza: The Value of Sympathectomy in the Treatment of Buerger's Disease. Surg., Gyn. & Obst., **79**: 359 (Oct.) 1944.
10. Ochsner, A.; and DeBakey, Michael: Treatment and Thrombophlebitis by Novocain Block of Sympathetica. Surgery, 491, 1939.
11. Wright, Irving: Conservative Treatment of Occlusive Arterial Disease. Arch. Surg., **40**:163-180 (Feb.) 1940.
12. Miley, George: The Control of Acute Thrombophlebitis with Ultraviolet Blood Irradiation Therapy. Amer. J. Surg., **60**:354-360 (June) 1943.
13. Snow, Wm. B.: The Rationality, Practicability and Limitations of Induced Fever as a Therapeutic Agent. Medical Record, **148**:448-452 (Dec. 4) 1938.

ROENTGENOLOGIC EXAMINATION OF THE STOMACH WITH PATIENT UNDER SODIUM PENTOTHAL ANESTHESIA*

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and
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The differentiation between what appears to be constant deformity of the pyloric portion of the stomach due to idiopathic causes and also to such etiologic agents as gallbladder disease, appendicitis, or benign pyloric ulcer, and the constant irregularity of pyloric neoplasm is at times difficult to make.[1 2 3] Several methods have been tried. Among these are (1) roentgenologic re-examination of the stomach after a suitable interval of time, (2) physiological doses of atropine and pilocarpine, (3) benzedrine sulfate, and (4) oral administration of barbiturates. However, even after the use of these agents, the diagnosis may still be in doubt.

During the past three years, three cases, observed in other institutions, which were suspected of having gastric malignancies have come to our attention. All of these cases failed to show gastric abnormality at operation. In each instance, a minimum of two careful roentgenologic examinations of the stomach had been made and a constant, apparently fixed deformity was demonstrated at each examination. This led to the diagnosis of probable gastric neoplasia.

In one case a partial gastric resection was done because the apparent lesion, as shown roentgenologically, was quite small and the surgeon felt that it might easily be missed at operation. Both gross and microscopic examination of the removed portion of this stomach revealed no evidence of pathological change. Apparently, in each case, the stomach had been subject to continuous spastic deformity

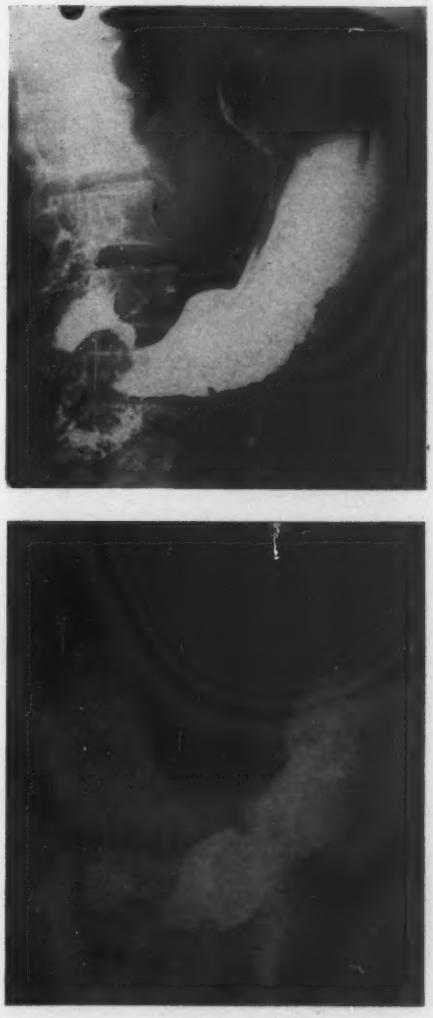

Fig. 1
Apparent fixed lesion of distal portion of stomach and pylorus. First examination.

*From Baylor University Hospital, Dallas, Texas.
*Received for publication November 6, 1944.

throughout the period during which multiple roentgenologic examinations had been made, and only after anesthesia of the patient had been produced, did the stomach relax and assume normal contours.

It was decided that any patient examined in the teaching clinic who showed evidence of marked gastric spasm, whether suspected of having an organic lesion or not, would be re-examined following the administration of an adequate amount of pilocarpine, and if this failed to change the picture, he would then be examined under general anesthesia. We hoped and expected the anesthesia to relax the spasm and consequently reveal the actual condition of the stomach.[4 5]

The preparation of choice would be one which would be easily administered and controlled, which would produce rapid anesthesia without side effects, and which would be reacted from quickly. One of us had considerable experience in the administration of "sodium pentothal" intravenously, and as it fulfilled the above requirements, it was selected for the case reported subsequently.

C. S., a 54-year-old white man, entered Baylor Hospital on July 15, 1942, shortly after receiving severe burns of his left leg, right forearm and the left side of his face. His wounds responded well to treatment, and he was soon discharged, improved. However, an area approximately 2x3 cm. in diameter near the middle of the lateral surface of his left leg had never closed in, and on May 18, 1943, he was readmitted to have skin grafts applied to this area.

His history revealed that for the three weeks prior to

Fig. 2
Lesion after pilocarpine.

Fig. 3
Examination under "pentothal." Deformed area has changed markedly.

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July, 1942, he had suffered with nausea and vomiting, and had sustained a slight weight loss.

Closer questioning revealed that his first abdominal complaint was a sensation of burning in the mid upper abdomen, accompanied by vomiting of clear fluid. This occurred one to three hours after eating, and was more severe at night. At the same time he would also have pain in the lumbar region of the back. He stated that he felt better when he kept his stomach full. He was quite positive that these symptoms had started three weeks before he was burned. His stools were always normal, and he was never conscious of having lost blood in his vomitus or stool. During his first hospitalization, his symptoms had lessened markedly in degree. However, several months later they gradually became more pronounced, and they were causing him considerable discomfort at the time of his second admission.

Laboratory data revealed a white blood count of 7,500 cells on May 19, with a normal differential. Three red counts made between May 19 and July 8 revealed a high of 4,760,000 and a low of 4,380,000. Hemoglobin determinations varied between 14.15 and 13.25 grams. Several urinalyses revealed no abnormal findings. Gastric analysis done on May 21 showed a total acid of 94 degrees with 56 degrees free acid. There was no lactic acid or blood. Several stool examinations revealed absence of mucus, pus, parasites and ova, but each gave a 4+ test for blood. However, the patient was on a general diet at all times when these tests were made. His Wassermann, Kahn, and Kline tests were all negative.

Roentgenologic examination of the gastro-intestinal tract done on May 20 revealed a negative esophagus. The stomach was normal in size with good tone. At intervals peristalsis was somewhat more active than normal. There was an apparently fixed lesion of the distal portion of the stomach and pylorus with evidence of crater formation as shown in the antero-posterior and right anterior oblique views (*Fig. 1*). There was no evidence of obstruction. The distal small bowel and colon showed no abnormality.

On the first and second days of June the patient was given tincture of belladonna m. 15 three times a day, and on the third of June he was given three doses of m. 25 each.

Repeated roentgenological examination of the stomach on June 4 did not show any appreciable change in the appearance of the gastric lesion (*Fig. 2.*)

On June 10 the patient was given the usual amount of barium by mouth, placed in the right anterior oblique position on the fluoroscopic table, and then anesthetized by the intravenous administration of a solution containing ⅝ gram of "sodium pentothal." Roentgenologic examination revealed a marked change in the deformed area of the stomach, thereby indicating that probably most of the deformity was due to spasm (*Fig. 3*).

The patient reacted from the anesthetic in about 20 minutes and suffered no undue effects from the procedure.

On June 23, 1943, a subtotal gastric resection was done, and a large gastric ulcer was found on the lesser curvature of the distal portion of the pyloric end of the stomach.

The pathological report was benign gastric ulcer.

COMMENT

A few facts concerning three cases, each of which showed a constant and apparently fixed lesion of the stomach on multiple roentgenologic examinations, are given. In each case the lesion disappeared during general anesthesia at operation.

A case report of a patient with a lesion of the distal portion of the stomach is submitted which was examined roentgenologically three times. The original roentgenological examination was followed by a second after pilocarpine was given to the patient. The appearance of the lesion was practically identical on these two examinations. The third examination was carried out quickly under anesthesia produced by a small dose of "sodium pentothal" given intravenously, and revealed relaxation of a previously narrowed portion of the original deformity, which apparently resulted from spasm.

The procedure is simple, and had no untoward effects on the patient. We believe such a method may, in certain doubtful cases, remove the necessity for operative procedure.

BIBLIOGRAPHY

1. Guyr, N. B.; and Thomas, R. A.: Filling Defects in Pictures Due to Disease of Adjoining Structures. Canad. M. A. J., **35**:367-370 (Oct.) 1936.
2. Heineker, T. S.; and Roseman, H. I.: The Use of Pentothal Sodium Intravenously for Gastroscopic Examinations. Rev. Gastroenterol. (Jan.) 1942.
3. Hollender, E.: Treatment of Pylorospasm with Digitalis. Am. J. Digest. Dis. and Nutrition, **4**:158-159 (May) 1937.
4. Gruber, C. M.: Effect of Barbituric Acid. Acid Derivatives on Pyloric Sphincter and Stomach in Unanesthetized Dogs. J. Pharmacol. and Exper. Med., 1147-1151 (Oct. 4) 1941.
5. Hausser, E.: X-Ray Observations of Spleen of Dog Under Ether, Sodium Amytal, Pentothal. Am. J. Physiol., **121**: 387-391 (Feb.) 1938.

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THE PROBLEMS OF FILARIASIS*

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When filariasis made its appearance among servicemen stationed in the South Pacific, a little more than a year and a half ago, it was a cause of considerable concern to medical men. This concern, more than anything else, had as its genesis the picture of elephantiasis seen in the natives, who have carried their infections throughout their life-time. Filariasis is a disease that exists endemically around the world in the tropical belts. It is especially prevalent in some parts of Africa and particularly in the Samoan area. Actually, it exists in epidemic form, although it is not correct to refer to its existence as epidemic, even where the incidence is high. Epidemics occur when large groups of uninfected populations immigrate into an infected area. That is what happened early in 1942, when several thousand American Marines were staging in British and American Samoa, Wallis and Ellice Islands. The causative organism is *Wucheria bancrofti,* which is the most prevalent of the four species of the filarial organisms. The life history of this nematode worm is fairly well understood. It is transmitted to man by an infected mosquito, which injects sexually immature microfilaria into the blood stream. These embryos make their way to the lymphatic channels and thence to the lymph nodes, where they mature into adult organisms. The male wraps itself around the female and fertilization occurs. After the female becomes gravid she expels microfilaria into the blood stream. The microfilaria are thus available to the bite of a susceptible mosquito. The microfilaria, in themselves, are non-pathogenic and non-infective to man. Actually, the circulating microfilaria can be transferred by transfusion to a normal individual without harm. They can only complete their development by passing through the mosquito and thence back to man. This is an important point from the standpoint of the infected serviceman. For example, if infected by mosquitoes which inject a definite number of microfilaria, it is impossible ever to have more than that number of adult worms, regardless of how long the individual lives. In other words, the adult worms are unable to reproduce themselves in the body and thus do not continue to accumulate.

The pathological and clinical manifestations seen in the serviceman are undoubtedly stirred up by the irritation of developing worms in the lymph nodes. Three predominant findings are noted in the early infections, namely: lymphangitis, lymphedema and lymphadenopathy. The lymphangitis is always retrograde, usually starting in the axilla, elbows or groins and then slowly descending. The extremes vary from the length of the extremities to a few centimeters. Although somewhat painful, it does not compare to the pain encountered in a streptococcic lymphangitis. Systemic toxic manifestations are practically absent. There may be a temperature of 101 to 102° F., which usually lasts about 48-72 hours. There still exists considerable controversy as to whether this lymphangitis, which is probably an allergic manifestation producing a lymph blockage, is associated, primarily or secondarily, with a streptococcus. The supporting evidence is not good for this theory, and the administration of sulfonamides or penicillin has no apparent effect on the lymphangitis. Lymphedema usually tends to be localized, although occasionally it is generalized, involving the entire arm or leg. An important point is that thus far it has been temporary, as no permanent swellings indicative of elephantiasis have been noted at this station in several hundreds of men over a period of eight months.

The picture of filariasis as it exists in Marine personnel from the Pacific can best be furnished from an analysis of some of the cases seen to date. In a large series of cases, 96 per cent were stationed in the Samoan group of islands, and only 4 per cent have contracted the infection elsewhere, Guadalcanal or Bougainville. This has occurred in spite of the fact that surveys of natives in the two general areas show

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*The opinions herein expressed are those of the author and not necessarily those of the Medical Department of the United States Navy.

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intensities of infection that are not too different. The reasons for this disparity may be accounted for by the living habits of the natives, opportunities for contact, vectors and the periodic appearance of the microfilaria. In Samoa, the average length of stay was 12.5 months, with a variation of 1 month to 27 months. The incubation period, dated from the time of the first possible exposure to the appearance of initial symptoms, averaged 9 months. When seen in the States there was little differentiation in the degree of involvement in the men who were in the endemic areas a few months as compared to those who were present two or more years. The anatomical involvements as lymphedema, lymphadenopathy and lymphangitis are noted in the sites and frequency as follows: neck, 2 per cent; upper extremities, 30 per cent; lower extremities, 9 per cent; scrotum, 1 per cent; cords, 15 per cent; and testes, 18 per cent. It was interesting to note that the right upper extremity was involved initially in 54 per cent of the instances, while the left was involved in only 37 per cent of the instances. For the lower extremities, the right exceeded the left, but the difference was not so marked; more use of the right arm might provide an explanation. However, for the genitalia the opposite was true; 33 per cent on the left and 55 per cent on the right.

From the picture of filariasis as it now exists in the serviceman, it is quite apparent that the current manifestations are extremely mild. The laboratory examination of the infected individual shows no abnormalities of the blood with the exception of an occasional instance of eosinophilia, which is not sustained. No microfilaria have been seen in the blood of any man on our station. There are a few verified instances when they have been observed in Army personnel following the concentration of large amounts of blood. Removal of enlarged lymph nodes for biopsy has been done and adult worms were revealed on histological examination, and in some instances microfilaria were detected *in utero*. In others, the adult worm was undergoing degeneration or calcification. This is not a recommended procedure from a therapeutic standpoint. However, it has provided valuable information in that it is now known that the body is gradually eliminating the infection. As yet there is no chemotherapeutic agent that is known to destroy the infection. H. W. Brown[1] has said that a pentavalent antimony compound, known as anthiomaline, will decrease the microfilaria count in Virgin Island natives, a finding of doubtful importance unless it can be demonstrated that the adult worm is also destroyed. The use of heat, cold, x-ray, non-specific proteins, and so forth, has not been shown to be beneficial.

There is a very prominent psychic element in the picture, as could be expected with an infection that involves the genitalia, plus the reaction after seeing the grotesque deformities in the natives with elephantiasis. Men are concerned about sterility and the possibility that continued assaults on the lymphatic system will leave a permanent lymphedema. We now have had many hundreds of men under constant observation for several months. Upon returning from overseas, many want to get married, do, and have already started families. This disposes of the sterility factor. As far as the possibility of servicemen's developing elephantiasis is concerned, this is an extremely unlikely possibility. Elephantiasis, in natives, appears late in life and rarely involves more than 5 per cent of the population, even in the most highly endemic areas. They have been continuously exposed to the bites of infected mosquitoes from the moment of their birth until this complication appears. Elephantiasis and filariasis are not synonymous terms, but elephantiasis is a complication that arises after many years where the assaults on the tissues have been constant throughout that period. The differences in the intensity of infection are quite plain when one examines the blood, as the natives show 60 per cent or more having high concentrations of microfilaria in the blood, whereas, in the serviceman it is a very unusual find to observe it in any individual. The secondary cases of filariasis which appeared in Charleston, South Carolina, a focus of infection which has now disappeared, were rarely associated with elephantiasis, because, like the serviceman, they were also very lightly infected. Brigadier N. H. Fairley,[2] in Australia, reports that in North Queensland, 10 per cent of the white population in 1920 had

circulating microfilaria. This focus has also disappeared and no case of elephantiasis ever developed.

This brings us to a consideration of the type of care best suited to these men returning with questionable or positive clinical symptoms. The term "questionable" is used because the clinical picture is the only means of establishing the diagnosis. It has been our policy to interview each man as he returns and explain to him very carefully the status of his infection. The following points are brought out. Since the microfilaria must continue their development in the mosquito, there is no possibility that the adult worms in the human body can reproduce themselves and thus they are not accumulating. Also the body is constantly destroying them. Therefore, the end result almost certainly has to be a good one and another year or two should see the disappearance of practically all symptoms in most cases referable to this disease. The man is then placed on a full duty status in a camp where the terms "recreation" and "convalescent" have been purposely omitted, as there is no better way of convincing a man that he belongs to a misfit group. He is given a series of gradually increasing physical exertion exercises in combination with a program encouraging out-door recreation. There is an immediate response, especially on the mental side, and it can now be stated that the majority of all men are not apprehensive about their infection. They do continue to have occasional flare-ups of edema, lymphangitis, and muscular soreness, but this persists only for a few days, and the attacks become less and less frequent. Actually, it has been necessary to hospitalize only one man in 800 for filariasis, and the average stay has been five days. Less than 5 per cent report to sick call with objective findings and 12 per cent with subjective symptoms. There is one factor which remains to be assessed, namely, the time factor, but all the accumulated evidence to date indicates that filariasis will not result in permanent disability as has been feared and postulated by many. The abuse of rest is very apparent during the convalescent period from this disease, as it is being observed in many other infections or disabilities, and certainly any man with filariasis needs very little encouragement to make him a permanent mental and physical cripple. If, by the careful study of several hundred men with filariasis, we can more clearly define the future course of this infection, it will be of real value to all those concerned, and during the course of these studies, if we should happen to disclose the ideal drug which would more rapidly terminate the course of this infection, the effects would also be far reaching. These two possibilities remain in the future, but an accomplishment can be definitely stated at this time, namely: there is no doubt that the program designed to keep men occupied mentally and physically during their convalescent period from this tropical infection is real preventive medicine in that it is preventing the inception of hundreds of cases of "hospitalitis." Thus, in the absence of curative drugs and with diseases that are gradually being eliminated by the defense mechanism of the host, our rationale of treatment is based on the concept that a physically fit body is better equipped to throw off an infection more quickly than the one that is permitted to deteriorate mentally and physically by long periods of hospitalization.

BIBLIOGRAPHY

1. Brown, H. W.: Treatment of Filariasis. J.A.M.A., **125**:952 (August 5) 1944.
2. Fairley, N. H.: Personal communication.

DISCUSSION (*Abstract*)

Dr. James E. Paullin, Atlanta, Ga. — As honorary consultant in medicine to Vice Admiral Ross T. McIntire, Surgeon General of the United States Navy, it was my pleasure this past autumn to visit most of the large naval hospitals on the West Coast. During this tour of duty I had the unusual opportunity of spending a day and a half with Dr. Coggeshall at Klamath Falls and of observing the work which he is doing at the Marine Barracks.

I was greatly impressed with the fact that many of the ideas which I had concerning filariasis and malaria were not supported by the careful studies which he was making of these diseases. I am glad that the Surgeon General has allowed us the privilege of hearing Dr. Coggeshall and receiving first hand information on filariasis.

The facts which he has related to you can be observed by anyone who would like to visit his laboratory and dispensary at Klamath Falls, Oregon. The United States Marine Barracks at Klamath Falls, on the day

of my visit, consisted of about 1,200 patients with filariasis and about 700 patients with malaria; some had both. There was no need for a hospital but there was a dispensary with a capacity of forty or fifty beds.

Dr. Coggeshall was well prepared to assume charge of the investigation of filariasis for the Bureau of Medicine and Surgery because of his previous experience obtained in studying tropical diseases in Africa, Samoa, and other islands in the South Pacific. He was able to utilize the services of those who had participated in his previous studies on tropical diseases so that with well trained associates he began his work at this center.

On the day of my visit, out of 1,900 marines only thirty were patients confined to bed in the dispensary; twenty-eight of these had malaria, and only two of them had minor manifestations of filariasis, despite the fact that 1,200 gave a history of this infection.

Dr. Coggeshall and his associates have performed a great service in clarifying the usually mistaken ideas which these soldiers have absorbed from unreliable sources concerning the disabilities which result from infection with filaria. I think all of you must have been impressed with the statement Dr. Coggeshall made, that of all of the patients he has seen he did not find micro-filaria in the blood of a single patient, and he examines microscopically the concentrate from 10 c. c. of blood in searching for the parasite.

This observation is of considerable comfort, not only to the patient but to the profession. It is realized that it would be extremely difficult for mosquitoes to become infested with filaria when there are few or none to be found in the blood of patients with the disease. By following a definite psychological approach to each patient their minds have been disabused to the fact that the disease will cause impotence and sterility. With this fear removed they continue with the program of rehabilitation and can soon be returned to active duty.

All of us are pleased to know that the disease, without reinfection, will gradually cure itself. Adult worms, when found in the lymph nodes, will soon die or calcium will be deposited about them. No new parasites enter the blood stream. There is no multiplication. Elephantiasis occurs in those individuals who have had repeated infections over a long number of years and not all of these will develop this manifestation of the disease.

It is of importance for us as practitioners of medicine to know the facts concerning filariasis since sooner or later we will have to treat some of these boys who will be discharged from the Army or Navy, and some few may present subjective symptoms or objective signs of the disease. Since it apparently is an infection of minor importance we will be in a position to deal with it more intelligently.

RHEUMATIC FEVER*

By WILLIAM WESTON, JR., M.D.
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I know of no subject more appropriate at this time for the Chairman of the Pediatric Section than rheumatic fever. The wide distribution, its increasing incidence, its unknown etiology, its disabling manifestations, often permanent, all contribute to make this disease of great interest as well as for serious research. Its mode of onset in children in sequence of signs may differ from that in adults and the true nature is screened.

Rheumatic fever is an infectious disease of unknown etiology that attacks various systems, chiefly involving the joints and heart. If you were asked to describe this disease, your mental vision would be a child with multiple painful joints, rapid heart, fatigue and anorexia, with or without cardiac complications. This is a description of an acute rheumatic with polyarthritis.

Lichtwitz's[1] definition is:

"Rheumatic fever is a noninfectious disease. It is not caused by a specific microorganism or virus, but by a sensitization to antigens, protein in nature, which in most cases are products of microorganisms. These microorganisms may either be pathogenic or nonpathogenic. But the clinical similarity of serum sickness to a certain type of rheumatic disease would seem to indicate that sensitizing antigens may also arise in response to foreign proteins that are not of microbic origin."

A pamphlet[2] from the Metropolitan Life Insurance Company says:

"Rheumatic fever is a systemic and probably infectious childhood disease of long duration, beginning most often between 5 and 15 years of age."

This leaves you with the question whether rheumatic fever is caused by an infection or an allergy. Until further light is shed, both infection and sensitivity must be accepted as possible causes.

The subject of rheumatic fever is widely discussed for several reasons. First, it is prevalent.

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Second, it is on the increase. Third, its symptoms and signs are well known, but not too well understood. Fourth, its cause has not been determined, and until the etiological factor has been found it will continue to evoke much research and interest, and, fifth, its economic cost is tremendous.

"Rheumatic fever kills more school-age children than any other disease."[3]

The disease belongs in pediatrics, as it is in the pre-school, school and teen-ages that it has its origin, though it may not be recognized until the twentieth or later year of life.

We know that rheumatic fever is common in the northeastern section of the United States, especially in the New England states. Recent investigation shows that it occurs in epidemic form in the other sections of the United States. It occurs in congregations of masses, where the lad from the country is thrown with the city boys, or expressing it in another way, it follows exposure of one who has not been in crowds to those who have lived with large numbers of people. There is no doubt that we are seeing more cases of rheumatic fever, the cause of which may be due to wartime congestion. Many sections are overcrowded due to housing problems, with no dwellings or apartments being constructed, overcrowding on all methods of transportation and in the schoolhouses. Improper heating and ventilation exist, which are conducive to upper respiratory infections which must be prevented if we expect to protect those with rheumatic fever from exacerbations. The subject is a real public health problem and a true challenge to the pediatrician. We are the group to find the case in the beginning, as an early diagnosis may mean the difference between a few years of invalidism and early death and a natural life expectancy. We must accept this challenge by making every effort to control the disease and diminish the increase.

Suggestions for the pediatrician in controlling rheumatic fever:

(1) Classify the cases: (1) Suspicious; (2) rheumatic fever, (a) mild, (b) moderate, (c) severe

(2) Organize an office or hospital clinic for rheumatics

(3) Social, economic and hygienic investigations of the home

(4) Simple, clear and brief instructions for child and parent

(5) Cooperation with board of health and welfare agencies

(6) Education of the public

If patients more than 5 years of age realize that we are interested in their condition and their future, it is my experience that we get excellent cooperation whether the patient is in bed or ambulatory. We can impress upon him the seriousness of the disease without frightening him extremely. One must be careful not to make the rheumatics a group of "untouchables" in their neighborhood, else they are prone to develop an inferiority complex.

The disease occurs most commonly in the temperate zones, but is found throughout the world, even in the tropics and on the equator. It is not a reportable disease in most states, but this is fast changing, and it is becoming reportable in more and more states each year. The Scandinavian countries have recorded this disease for a number of years. In Denmark it is reported in 20 per cent of the population; in Norway it is 10.7 per cent, while in our own Massachusetts "rheumatism affects 10 per cent of the entire population."[4] In Scotland, England, and Wales a higher percentage prevails.

The climate has some effect upon the number of cases as the above data would lead you to believe, but more important is the kind of weather, that is, the exposure to dampness and chilling air, with temperature fluctuations. The statistics which Wedun and Wedun[5] compiled in the Cincinnati hospitals as compared to those by Hedley in Philadelphia show a greater prevalence in the larger city (Philadelphia) where the handicaps associated with cities may account for the difference. The tabulations of the morbidity and mortality run almost parallel. The investigation and review of "Rheumatism in Connecticut" by Paul and Deutsch[6] shows the incidence fairly high in the crowded cities, but the mortality for the state as a whole is comparatively low. Hedley had a higher percentage in the same area. Environment and locality play a part in this disease. Yes, we know overcrowding alone, and the increase of the number of siblings in a family can produce more upper respiratory infections which in turn are prone to

cause more rheumatic fever. If one continues to insult the respiratory track with repeated infections, then the patient will probably develop something more serious. There is a community of approximately 400 people about 90 miles distant from Columbia, from which there have come four cases of rheumatic fever in the past year: two of these were in the same family; one, a girl 4½ years of age, and the other a boy of 8 years. I am told by their parents that there have been two cases of rheumatic fever from the same territory in the armed forces. The town is low and swampy, which makes it damp most of the time, and we are well aware that localities of this kind are conducive to the development of rheumatic fever.

Heredity is an important factor in this disease and frequently we find that one of the grandparents died of rheumatic fever. The larger the family in a poor economic condition, the greater the number of rheumatics, as there is overcrowding, lack of attention, improper clothing and poor nutrition. The younger the child in this family, the more subject it is to respiratory infection brought home by the older children from school. Not until the child with a common cold is isolated at school will we reduce our cases, because what might be a coryza in one will attack the next as sore throat or bronchitis, and finally rheumatic fever. Yet its origin was just the "sniffles."

The hemolytic streptococcus seems to be the organism which is closely associated with rheumatic fever. One[7] of the investigators says that rheumatic fever is always preceded by an upper respiratory infection associated with the hemolytic streptococcus. This organism must have a synergistic action which produces either the initial or recurrent infection of rheumatism. Means must be found to impede or block the dissemination of this coccus. Improved ventilation and the use of ultra-violet irradiation have been helpful, but its application has not been sufficiently tried in schools and other places where crowds assemble. The majority of my cases (60 per cent) can be classified as above normal of the standard of society (that is, clothing, housing, and so on), yet these develop rheumatic fever.

We know how the children sleep, the garments they wear, the weather to which they are exposed, yet the importance of proper food is often overlooked. The nutritional element has been emphasized by Coburn and Moore.[8] When foods rich in protein, vitamin A, calcium, and iron were added to the diet, the children did not contract rheumatic fever.

There have been 30 active cases in my series in the past two years. All of these with the exception of two lived in the central part of South Carolina. One came from Norfolk, Va., and the other from New Jersey. They had lived in these areas for the preceding two years where their parents were doing war work.

Age	4-14 years
Average	7½ years
Sex—	
Male	16
Female	14
Race—	
White	24
Colored	8
Mortality	1

Table 1

Objective Signs—	
Carditis	14—7 white, 7 negro
Tachycardia	28
Fever	30
Chorea	2
Subjective Signs—	
Polyarthritis	16
Precordial pain	4
Muscle and abdominal pain	24

Table 2

Laboratory Findings—	
Electrocardiogram (a delayed A-V conduction and a prolonged P-R interval)	12
Sedimentation rate (Wintrobe's method), 7 mm. to 62 mm. above 10 mm. per hour	29
Leukocytosis, 10,000 to 20,000	26
X-ray, enlarged heart	6

Table 3

The criteria used to make the diagnosis follows:

(1) Elevation in temperature with recurrences
(2) Acceleration in heart rate
(3) Increased perspiration
(4) Muscle pain
(5) Joint pain, usually multiple
(6) Abdominal pain
(7) Carditis
(8) Increased sedimentation rate
(9) Electrocardiogram
(10) Leukocytosis

Jones[9] divides diagnoses into two classes:

Major Manifestations—
(1) Carditis
(2) Arthralgia, migrating joint arthritis
(3) Chorea
(4) Subcutaneous nodules
(5) Recurrence of rheumatic fever

Minor Manifestations
(1) Fever
(2) Abdominal pain
(3) Precordial pain
(4) Rashes
(5) Epistaxis
(6) Pulmonary findings
(7) Laboratory findings

The combination of minor signs does not preclude rheumatic fever, but the existence of one major and two or more minor manifestations is sufficient to make a diagnosis.

There are two complaints in the list which I would like to emphasize as early manifestations which are often overlooked. These are muscle pain and abdominal pain, all too frequently spoken of as growing pains. The muscles most frequently complained of are the gastrocnemius, ham strings, and quadriceps. These muscles belong to the group which bear the brunt in the usual form of exercise, but a child does not continue to complain of them without having good reason. One-third of my cases complained of abdominal pain and it is confused with appendicitis, but more frequently the pain is on the left side, and often the child is awakened in the night with cramps in the abdomen. It is not associated with nausea and vomiting, but is sometimes exaggerated by eating. The area of tenderness is usually found in the left lower quadrant and is demonstrated on comparatively superficial palpation and not on deep pressure. It may be associated or might have been brought on by difficult defecation or constipation. It is necessary in our section of the country where cats and dogs run everywhere to rule out oxyuri, ascaris, and uncinaria infestation.

To find the nodules which most often occur in the extremities is quite uncommon in our group. They were present in only two, in the girl from New Jersey of 12 years, and in a negro of 14 who evidently had his first attack in December, 1939. Likewise, erythema marginata is infrequent. Again, only two show this discrasia, one a 6-year-old girl who came from the Atlantic seaport of Norfolk. This child has recurring attacks, at which time the lesions become numerous on the upper and lower extremities with swelling of the phalangeal joints accompanied by fever. She has no carditis at this time.

It is interesting to note that seven of the eight negro patients had involvement of the heart. The disease apparently acts rapidly and in a fulminating manner with this race. Our population is normally 65 per cent white and 35 per cent negro, but is more nearly 70 per cent and 30 per cent from the influx of army wives and children.

The number of cardiacs is less than in most series, as I believe the disease is not so severe in our climate. The laboratory methods of diagnosis are helpful, but in no way as yet conclusive in making a diagnosis of rheumatic fever. The sedimentation rate is perhaps the most indicative of the progress of the case. There was some upper respiratory infection preceding the attacks, but the type of organism was not determined. A recent article on rheumatic fever by Beach and Ravenel[10] disclosed only 43 cases of rheumatic fever admitted to the Pediatric Department of the Roper Hospital in a 10-year review, while in six months since the establishment of the rheumatic fever clinic there were 32 rheumatics, 20 of which were admitted to the hospital. Twenty-four of the 32 were negro. Twenty-two were classified as active rheumatic heart disease and 10 as inactive. The total number is only 11 less in the six months than in the 10-year review.

The differential diagnosis must be made from lupus erythematosus, arthritis deformans in children (Still's disease), acute rheumatoid arthritis, undulant fever and cycle cell anemia.

The economic importance of rheumatic fever cannot be too strongly emphasized. It is a costly illness and oftentimes a prolonged one. The majority of cases must be cared for by the state and the United States government, which means that we must pay taxes incurred by these unfortunates. The amount of expense can best be illustrated by giving this table which was published by Coburn[11] in the *Journal of the American Medical Association:*

DISEASE	No. of Cases	Estimated Days Lost
Scarlet fever	4,973	108,908
Rheumatic fever	1,373	126,637
Pneumonia	1,383	26,511
Tonsillitis or pharyngitis	50,000	285,000
Total days lost to four diseases		557,056
Days consumed by personnel caring for these diseases		1,114,114
Estimated cost in salaries		$5,000,000
Estimated cost in pensions for disabilities		$10,000,000
Total cost for four streptococcus manifestations at one naval training station		$15,000,000
Total man-days lost for four streptococcus manifestations at one naval training station		1,671,171

There is yet no etiological cause found to establish a definite diagnosis; consequently we must collect the symptoms and signs manifested. The first attack may often be misleading and the diagnosis not made until the complications have set it. One of my cases, H. G., aged 14, had his origin in 1939. At the age of 9 years he was admitted to the Columbia Hospital in December, 1939, where he was kept for nine days, being dismissed with a diagnosis of acute sore throat. But since February of 1940, he has been a rheumatic cardiac cripple.

Treatment has consisted of rest in bed for four to six weeks after the subsidence of the acute attack, the usual rational. There is a tendency to shorten this time, but when there is cardiac involvement this is probably insufficient.

The sulfa drugs are contraindicated in the active rheumatic attack and at times may be used as a provocative test, as the disease will become worse. The salicylate remains the drug of choice in the active case.

One can hardly review the literature in recent years without being impressed with the use of the sulfonamides. Following the rheumatic fever conference in Washington on October 3, 4 and 5, 1943, some 10 of my patients were given sulfadiazine, 0.75 to 1.5 grams per day according to age and weight until May, 1944. There was only one recurrence in the group, while in the untreated there were four.

Holbrook[12] reports the use of sulfadiazine as a prophylaxis in the Army Air Force with the following conclusions:

"(2) Acute rheumatic fever occurs in high incidence of hemolytic streptococcus infections.

"(3) A 50 to 75 per cent reduction in the incidence of respiratory diseases and streptococcic infections has been accomplished by the use of sulfadiazine prophylaxis under carefully controlled conditions and on a significantly large troop population. No serious drug reactions occurred.

"(4) From the partial data at hand, it appears that the reduction in rheumatic fever parallels that of respiratory and streptococcic disease."

SUMMARY

The outline as suggested by Paul[13] has been followed in preparing this paper. Rheumatic fever is much more common in the Southern states than is usually believed. There are certain factors which seem to have a direct bearing on the development of this disease: first, constitutional susceptibility; second, upper respiratory infections and, in particular, the hemolytic streptococcus, and, third, nutritional deficiencies. Control of the upper respiratory infections associated with streptococci is necessary to reduce the morbidity of rheumatic fever and the recrudescences. Other factors such as environment, exposure to damp weather, chilling, and heredity, play an important part in rheumatic fever, but are secondary to the first three enumerated. The number of cases reported (30) is too small to be of any great value. Community rheumatic fever clinics should be established under competent medical and pediatric supervision.

CONCLUSIONS

(1) Rheumatic fever exists in the South and is not uncommon, if one can use South Carolina as an indicator.

(2) The disease is less severe with fewer cardiac complications in this climate.

(3) The use of the sulfonamides as a prophylaxis in this disease is the best medication yet offered.

(4) The negro does not seem to be more susceptible than the white, but the disease is more virulent in that the heart is more frequently involved.

REFERENCES

1. Lichtwitz, Leopold. Rheumatic Fever. P. 1. New York, N. Y.: Grune and Stratton.
2. Metropolitan Life Insurance Company: Rheumatic Fever in Children. 1943.
3. Huse, Betty: Rheumatic Fever in Children. (Reprint from The Child-Monthly Bulletin, Vol. 7, No. 11 (May, 1943), pp. 158-161; U. S. Department of Labor, Children's Bureau, Washington, D. C.)
4. Lichtwitz, Leopold. Rheumatic Fever. Chap. 2, p. 4. New York, N. Y.: Grune and Stratton.
5. Wedum, A. G.; and Wedum, B. G.: Rheumatic Infections in Cincinnati Hospitals. Amer. J. Dis. Child., **67**:182.
6. Paul, John R.; and Deutsch, Joyce V.: Rheumatic Fever in Connecticut. Connecticut State Department of Health, Hartford, Connecticut, 1941.
7. Jones, T. Duckett: Amer. J. Pub. Health, **31**:— (Aug.) 1941.
8. Coburn, A. F.; and Moore, L. V.: Amer. J. Dis. Child., **65**:— (May) 1943.
9. Jones, T. Duckett: Diagnosis of Rheumatic Fever. J.A.M.A., **126**:—, 481.
10. Beach, M. W.; and Ravenel, B. O.: Rheumatic Fever. J. South Carolina M. A., p. 199 (Oct.) 1944.
11. Coburn, A. F., M.C.-V(S), USNR: The Prevention of Respiratory Tract Bacterial Infections. J.A.M.A., **126**:84.
12. Holbrook, W. Paul: The Army Air Forces Rheumatic Fever Control Program. J.A.M.A., **126**:84.
13. Paul, John R.: The Epidemiology of Rheumatic Fever and Some of Its Public Health Aspects. Printed by the Metropolitan Life Insurance Company, Second Edition, p. 109.

FEVER THERAPY WITH INTRAVENOUS FOREIGN PROTEIN IN NEUROSYPHILIS*

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It is an established fact that fever therapy is of value in treating most stages of syphilis and in certain other diseases. It is also an accepted fact that foreign protein reactions are beneficial in the treatment of syphilis and other abnormalities. (I still remember distinctly a comment by Dr. M. F. Engman, Sr., here in St. Louis over twenty years ago. A student was asked how to make the eruption in secondary syphilis disappear most rapidly. The student's answer was to give arsphenamine intravenously. Dr. Engman replied that the correct answer was to give typhoid vaccine intravenously.)

Since the nature of the mechanism involved in fever protein therapy is not clearly understood, a number of actual and theoretical reactions may be enumerated: (1) The direct action of heat on the infectious agent and the inflammatory area; (2) an increase in the general metabolic and functional activities of the body resulting in accelerated humoral and tissue immunity formation; (3) an acceleration of the beneficial effects of the immune bodies and the chemotherapeutic substances present in the patient's body; (4) a stimulation of the protective and curative functions of the hematopoietic and reticulo-endothelial systems; (5) constriction followed by dilatation of the capillaries, arterioles and venules; (6) an increase in the permeability of the capillary walls and the tissue cells to antibodies and most chemicals, with also a partial breakdown in the hemato-encephalic barrier.

The average institution has difficulty keeping an active strain of malaria on hand. The production of fever reactions by the use of mechanical methods entails considerable expenditure for equipment and personnel. Because of these reasons and the logical suggestions of Kemp and Stokes[1] when they recommended the use of bacterial protein and concomitant use of chemotherapy in the treatment of syphilis, we began this system in selected cases. Previously, Kunder, Hall and Gerty[2] had used typhoid vaccine for the production of fever reactions in general paralysis with favorable results and minimum hazard. The method of divided dosage recommended by Nelson[3] made it possible to obtain satisfactory temperature rises with intravenous foreign protein. Our preliminary results justified continued use of this type of treatment in neurosyphilis, and now it is applicable also to the treatment of earlier stages of syphilis and other diseases. During our experience, improvements in technic have neces-

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sarily occurred so that now we feel it is probably the method of choice in treating many of those conditions in which fever therapy and chemotherapy are indicated.

The duration of fever following an unsupported intravenous injection of foreign protein is relatively short. A fairly rapid increase in dosage of the vaccine is necessary to produce satisfactory hyperpyrexia. By wrapping the patient in blankets and surrounding him with hot water bottles, it was demonstrated that the dosage could be decreased and the fever prolonged. Further improvements in technic are described subsequently and have been adopted for routine use. A more nearly ideal method would be the use of intravenous foreign protein with a heat cabinet similar to the Simpson-Kettering apparatus.

The combination of hyperpyrexia and protein reaction should be more effective therapeutically than either alone. This reaction is accomplished with malaria and with the method to be described. Fever therapy by physical methods may not be so beneficial. Reports published in the past have been based on results obtained with the relatively short periods of fever produced by foreign protein alone, or with the long periods of fever obtained by mechanical methods. With the combined measures outlined, equivalent durations of fever are obtained in addition to the protein reaction.

The foreign protein reaction produced with typhoid vaccine is not associated with, or followed by, the debilitating effect of malaria. This weakening effect of malaria may account for the fact that no better results have been obtained than with mechanical fever. Furthermore, therapy with arsenic and bismuth cannot be given at the same time as malaria. The method here described includes the triple play: adequate fever, shock reaction, and specific chemotherapy.

Animal experimentation reveals that the curative dose of arsenicals in syphilis, when combined with fever, is about one-half that required without fever. There is some indication that fever enhances the penetration of chemotherapeutic agents into the tissues, which would have the effect of intensifying treatment. There is a decrease in the rapidity in the excretion of arsenic when administered simultaneously. With the longer retention of heavy metals in the body, dosage must be carefully calculated.

Since the development and use of penicillin in the treatment of syphilis, one might now ask why other measures should be discussed. Penicillin, however, has not yet shown itself to be a complete and reliable cure in all stages of syphilis. Preliminary experiments[4] seem to show that fever enhances the action of penicillin on the central neural axis, and this is indicated by an increase of penicillin in the spinal fluid with fever.

It is our opinion that the majority of cases of neurosyphilis should have regular or moderately intensive chemotherapy for four to six months before fever-protein therapy. During this period all associated abnormalities should be corrected. Intensive chemotherapy is given during fever-protein therapy, with an intravenous injection of trivalent arsenical at the height of the fever. Optic atrophy and paresis are indications for immediate fever treatments.

It is our opinion that tryparsamide and other pentavalent arsenicals should be used only in the later stages of the treatment of neurosyphilis, and then in alternating courses with trivalent arsenicals. The pentavalent drugs alone have little therapeutic value and damage to the optic nerve is frequent. The reports of benefit resulting from pentavalent arsenicals in neurosyphilis have been due, in our opinion, mainly to the bismuth and other measures administered simultaneously.

It is desirable to continue antisyphilitic treatment for a long period after the administration of fever therapy in order to prevent relapse and to obtain optimal improvement. Repetition of the fever-protein may be indicated. The bases for decision as to the proper management of a case depends on the combined clinical and laboratory findings.

PROCEDURE

Candidates are selected with consideration for the well known contraindications to fever therapy. A complete physical examination includes fluoroscopic, roentgenographic and electrocardi-

ographic studies of the heart and aorta; the laboratory evaluation consists of a blood count, urinalysis, serologic testing of the blood and spinal fluid, icterus index, blood urea and plasma proteins, and any abnormal findings being investigated by the indicated special procedures. Throughout the course of fever, patients are followed clinically and by suitable laboratory studies.

The necessary equipment is simple and available in any hospital. The bed is protected and insulated by a large rubber sheet over which is placed a cotton sheet. A light metal cradle from which is suspended one 100 watt light bulb and cord protected by a screen is then placed on the bed. The cradle is covered by both blankets and a rubber sheet sufficiently large to be tucked in at the sides and foot of the bed and extending upward to cover the patient's shoulders. Further insulation is afforded by several layers of blankets about the head and shoulders, so that only the face is exposed. With this arrangement the patient is free to move and can cooperate easily with such routine procedures as temperature taking.

Typhoid-paratyphoid vaccine is used as the thermal agent. The average initial trial dose for an adult male is 50 M killed organisms suitably diluted in normal saline and injected intravenously. The dosage varies, however, with the weight and age of the patient. If a satisfactory febrile response is obtained, the amount of vaccine is doubled for each succeeding bout; when the response is poor the dosage may be tripled or quadrupled. Fever bouts are usually given on three successive days with a day of rest intervening between. This rule, however, varies with the individual tolerance of the patient and bouts may be given only on alternating days until the usual total of ten episodes is accomplished.

After the third or fourth bout the split dosage technic is utilized. With this method, the initial injection acts as a "trigger" raising the temperature moderately (99-102° F); a second injection given after an interval of 1½-2 hours causes a rapid rise in fever. The total amount of vaccine required to produce a satisfactory reaction is reduced approximately fifty per cent. If the patient is responsive to the vaccine, satisfactory fevers are often obtained through several episodes with only slight increase in the dosage. However, if an increase in amount of vaccine is required, no untoward reactions occur. We have given as much as 2,000 M twice using divided dosage.

It is important to check the patient carefully immediately before vaccine is administered, since even mild elevations in temperature may act as a "trigger." A fever of 99.4 or 100° F. frequently accelerates the vaccine and may be equivalent to tripling the dose. Patients with elevations of this type should be permitted to rest without therapy until the temperature is stabilized within normal limits.

Ordinarily, the administration of vaccine is followed within ½ to 1 hour by a shaking chill lasting 20-30 minutes which, however, may be aborted by 5 c. c. of 10 per cent calcium thiosulfate intravenously at the onset. A rapid

AN OUTLINE OF PROCEDURE

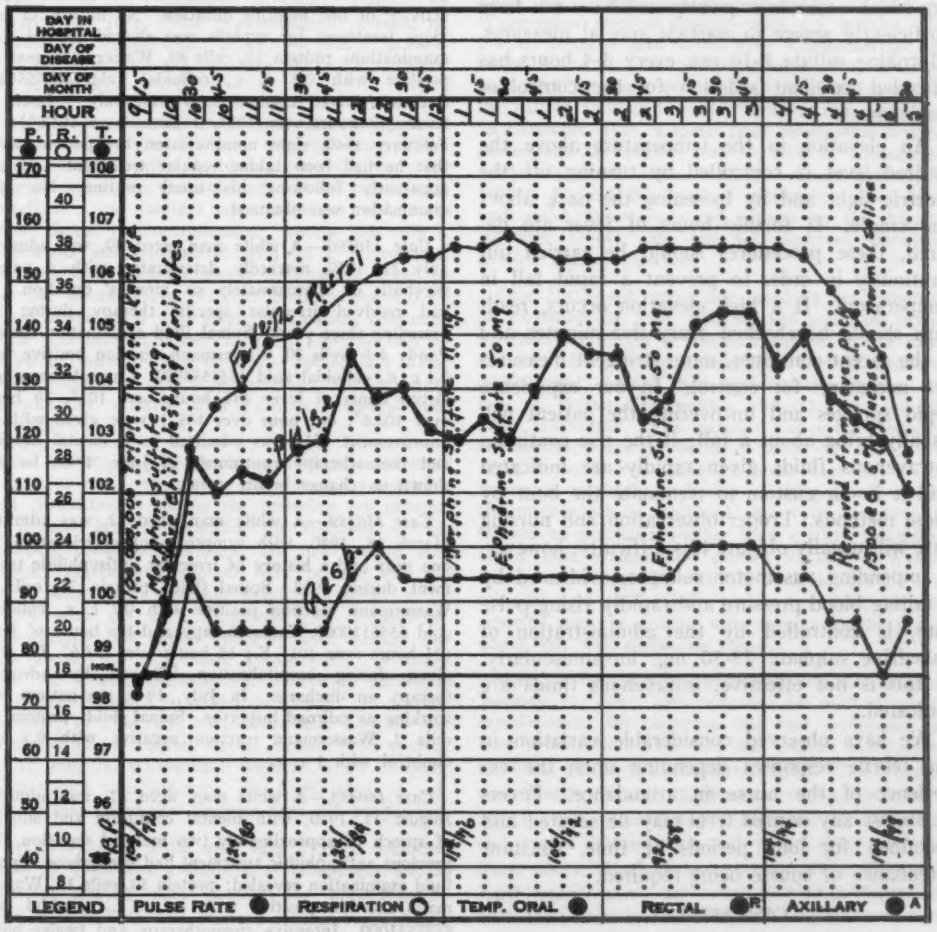
Day	Bout	Hour		
1	—	———	Clinical study	
2	—	———	Clinical study	Bismuth
3	1	8 a. m.	50 M. vaccine	Arsenical
4	2	8 a. m.	100 M. vaccine	
5	3	8 a. m.	200 M. vaccine	Arsenical
6	—	———	Rest	Bismuth
7	4	8 a. m.	400 M. vaccine	Arsenical
8	5	8 a. m. 10 a. m.	200 M. vaccine 200 M. vaccine	
9	—	———	Rest	
10	6	8 a. m. 10 a. m.	300 M. vaccine 300 M. vaccine	Arsenical
11	7	8 a. m. 10 a. m.	500 M. vaccine 500 M. vaccine	
12	—	———	Rest	Bismuth
13	8	8 a. m. 10 a. m.	800 M. vaccine 800 M. vaccine	Arsenical
14	9	8 a. m. 10 a. m.	1000 M. vaccine 1000 M. vaccine	
15	—	———	Rest	
16	10	8 a. m. 10 a. m.	1200 M. vaccine 1200 M. vaccine	Arsenical
17	—	Re-examination		Bismuth
18	—	Discharge		

Table 1

temperature rise usually to 104-106° F. occurs and is maintained by the insulated cradle and radiant light.

The routine for care of these patients is relatively simple; rectal temperatures are taken at ½ hour intervals until the fever reaches 102° F., and then every 15 minutes until it again falls to 102° and at half-hour intervals thereafter until normal limits are reached.

The blood pressure is taken every half hour throughout the fever, the pressure cuff being left in place to prevent unnecessary exposure. Fluids are limited usually to 60 c. c. of normal saline at half-hour intervals while the temperature is elevated but liquids are forced between bouts. It is necessary to avoid excessive fluid intake during the febrile episodes to prevent undue lowering of the temperature. At the termination of the individual fever bout 1500 c. c. of 5 per cent glucose in normal saline with added vitamin B complex and ascorbic acid is administered intravenously. When the



Total number of hours: Temperature 101° F. or over, 7 hours; Temperature 103.6° F. or over, 6 hours, 15 minutes; Temperature 105° F. or over, 5 hours, 15 minutes.

Chart 1
Illustrative Fever

temperature is stabilized at normal levels the patient is permitted to be about the ward as he desires. High protein and high vitamin diets are routinely ordered and are supplemented by additional sodium chloride.

Arsenicals are administered at the height of the fever, arsphenamine, mapharsen and clorarsen in proper dosage having been used with no untoward reactions. The latter drugs are frequently administered during each febrile bout.

Minor reactions consist of nausea and vomiting which occur infrequently and have not been sufficiently severe to warrant special measures. Morphine sulfate 8-16 mg. every 3-4 hours has afforded excellent sedation for the control of restlessness.

An elevation in the temperature above the desired level is controlled by turning off the electric light and by loosening the pack about the cradle. If further hours of fever are desired, these procedures should be carried out cautiously in order to prevent a rapid fall in temperature. If a high elevation occurs, readings should be checked every five minutes and if the ascent continues, more stringent measures are necessary for control. In our experience tepid sponges and uncovering the patient will usually bring about a fall; if the rise continues intravenous fluids given rapidly are indicated and it is our custom to terminate the bout by these methods. Proper observation and nursing care will usually obviate this difficulty, however.

Impending vasomotor collapse, evidenced by a falling blood pressure and rapidly rising pulse rate, is controlled by the administration of ephedrine sulphate 25-50 mg. intramuscularly. If this is not effective, intravenous fluids are indicated.

We have observed considerable variation in the febrile responses depending upon the experience of the nurse in attendance. Fevers of almost any desired level may be secured and sustained for long periods of time, constant attendance of course being required.

CASE REPORTS

Brief case summaries of nineteen patients treated with intravenous triple typhoid vaccine from 1939 through 1943 are presented.

Case 146309.—A white man, aged 39, was admitted February 7, 1939, with mild symptoms of paretic changes of 6 months' duration. He had received a large amount of chemotherapy since 1933. His spinal fluid was Pandy 4+, cells 4, Wassermann reaction, positive with 0.2 c. c., colloidal gold 5555555553. Trivalent arsenicals and six bouts of fever (22 hours over 101°, 9 hours over 103.6°, 3 hours over 105°) were given followed by regular chemotherapy on discharge. In June, 1943, the patient was working regularly at preparetic level; spinal fluid protein 40, cells 1, Wassermann reaction negative with 0.6, doubtful with 1 c. c., colloidal gold 1123321000.

Case 149585.—A white man, aged 36, was admitted June 12, 1939, with emotional instability and hyperactivity of one month's duration. No history of previous treatment for syphilis was elicited. Spinal fluid examination: protein 75, cells 85, Wassermann reaction positive with 0.2 c. c., colloidal gold 5555555330. Patient received chemotherapy and only 5 bouts of fever (18 hours over 101°, 2 hours over 103.6°). In February 1940, eight months later, the patient wrote that he had been taking regular treatment and was apparently following his usual routine. No later examination was obtained.

Case 150590.—A white man, aged 39, was admitted July 21, 1939, markedly deteriorated with a paretic psychosis of approximately six months' duration. He had received irregular specific therapy during the preceding three years. Spinal fluid examination showed Pandy 4+, cells 20, Wassermann reaction positive with 0.2 c. c., colloidal gold 5555553000. Chemotherapy and eleven bouts of fever (49 hours over 101°, 19 hours over 103.6°, one hour over 105°) were given with no improvement. He was admitted to a mental hospital and chemotherapy continued; in June, 1943, he had shown no change in his status.

Case 156589.—A white man, aged 52, was admitted March 18, 1940, with symptoms of deterioration for one year and a history of irregular antisyphilitic treatment during 1938. Spinal fluid: protein 75, cells 9; Wassermann reaction positive with 0.2 c. c., colloidal gold 5555110000. Chemotherapy and ten bouts of fever (45 hours over 101° F.; 15 hours over 103.6° F.) were given during hospitalization followed by adequate therapy on discharge. In July, 1944, the patient was working as railroad inspector. Spinal fluid: protein 30, cells 2, Wassermann reaction negative with 0.5 and doubtful with 1 c. c.

Case 160453.—A white man, aged 37, was admitted August 11, 1940, with mental confusion and slurring of speech of approximately two months' duration. No previous antisyphilitic treatment had been given. Spinal fluid examination revealed: protein 50, cells 17, Wassermann reaction positive with 0.2 c. c., colloidal gold 5555541000. Intensive chemotherapy and twelve bouts of fever (46 hours over 101°, 16 hours over 103.6°, 4 hours over 105°) were administered with temporary improvement. On discharge, clinical progression continued despite

chemotherapy. In April, 1941, a spinal fluid examination showed Pandy 1+, cells 0, Wassermann reaction positive with 0.2 c. c., colloidal gold 5554311000. At this time, the patient was transferred to a mental hospital and had shown no improvement through October, 1944.

Case 166266.—A white man, aged 35, was admitted March 7, 1941, saying that he had received regular antisyphilitic therapy since September, 1940. During the preceding four months he had developed symptoms of depression, nervousness and emotional instability and physical findings were consistent with early taboparesis. Spinal fluid: protein 50, cells 0, Wassermann reaction positive with 0.2 c. c., colloidal gold 4433321000. The patient received chemotherapy and 12 bouts of fever therapy (56 hours over 101°, 23 hours over 103.6°, 9 hours over 105°) followed by regular therapy on discharge. In June, 1944, re-examination revealed no abnormalities. Spinal fluid: protein 40, cells 0, Wassermann negative with 0.1, positive with 0.5, colloidal gold 1111000000.

Case 169143.—A white male, aged 54, was admitted June 9, 1941, saying he had received antisyphilitic therapy for 1½ years. No history regarding the onset of mental symptoms was obtained, but the patient was overtalkative and findings were consistent with early paresis. Spinal fluid examination: protein 150, cells 7, Wassermann reaction positive with 0.2 c. c., colloidal gold 5555555553. Chemotherapy and twelve bouts of fever (47 hours above 101°, 17 hours above 103.6°, 5 hours above 105°) were given. The patient continued regular treatment at home. In July, 1944, he said he had worked regularly as a salesman. Spinal fluid examination: protein 50, cells 0, Wassermann reaction negative with 0.1, positive with 0.5 c. c. colloidal gold 012210000.

Case 164948.—A white male, aged 42, was admitted on June 23, 1941, completely disoriented, having been given chemotherapy during the preceding six months. No definite history regarding the duration of his symptoms could be obtained, but the patient was markedly deteriorated. Spinal fluid protein was 75, cells 1, Wassermann reaction negative with 0.2 c. c., positive with 0.5 c. c., colloidal gold 5555553000. Chemotherapy and twelve bouts of fever therapy (40 hours above 101°, 25 hours above 103.6°, 4 hours above 105°) were administered. Following discharge, the patient received a moderate amount of specific treatment; in February, 1942, there had been no improvement in his mental status. Spinal fluid protein was 50, cells 21, Wassermann negative in all dilutions, colloidal gold unsatisfactory. In April, 1944, it was reported that his clinical findings were still progressing.

Case 171732.—A white man, aged 29, was admitted August 30, 1941, with a diagnosis of taboparesis, mental symptoms having been present for approximately fifteen months. He had received routine antisyphilitic therapy during the preceding six years. Spinal fluid protein was 50, cells 13, Wassermann reaction positive with 0.2 c. c., colloidal gold 5555555000. Chemotherapy and ten bouts of fever (37 hours over 101°, 15 hours over 103.6°, 5 hours over 105°) were given and the patient continued treatment with moderate regularity after discharge. His mental status has improved moderately, but there has been a slow progression of his tabetic findings. Tryparsamide given by his local physician had caused definite constriction of the visual fields which previously had been normal. In August, 1944, spinal fluid examination was: protein 30, cells 0, Wassermann reaction negative with 1 c. c., colloidal gold 0000000000.

Case 172028.—A white woman, aged 38, was admitted September 8, 1941, with an acute maniacal psychosis of several days' duration. Inadequate treatment for syphilis had been administered twelve years previously; spinal fluid examination showed protein 50, cells 41, Wassermann reaction negative with 0.6, positive with 1 c. c., colloidal gold 5534311000. Chemotherapy and twelve bouts of fever (61 hours over 101°, 30 hours over 103.6°, 8 hours over 105°) were administered and the patient continued regular therapy after discharge. In December, 1942, a spinal fluid examination was repeated and the protein was 30, cells 5, Wassermann reaction doubtful with 1 c. c., colloidal gold 1233-100000. Patient has made a moderately good home and social adjustment and reports to the hospital regularly (1944). She has not, however, permitted another lumbar puncture.

Case 174354.—A white man, aged 54, was admitted on November 24, 1941, with marked grandiose paretic psychosis and history of mental symptoms of one year's duration. No previous antisyphilitic therapy had been administered. Spinal fluid examination: protein 100, cells 54, Wassermann positive with 0.2 c. c., colloidal gold 5555555555. The patient was given intensive chemotherapy and 14 bouts of fever (83 hours over 101°, 25 hours over 103.6°, 2 hours over 105°). He improved markedly and was discharged on regular treatment which he continued. By November, 1942, he showed no peculiarities other than a slight irritability. Spinal fluid examination: protein 50, cells 0, Wassermann reaction negative with 0.2, positive with 0.6 c. c., colloidal gold 1232210000. In October, 1944, his wife reported that the patient was working regularly elsewhere and was continuing therapy.

Case 175988.—A white man, aged 42, was admitted January 23, 1942, with evidence of marked paretic deterioration. His physician said that symptoms had been present since 1940 and that routine antisyphilitic treatment had been administered. Spinal fluid examination: protein 50, cells 27, Wassermann reaction positive with 0.2 c. c., colloidal gold 5432211000. Chemotherapy and twelve febrile bouts (50 hours above 101°, 21 hours above 103.6°, 9 hours above 105°) given with rapid improvement. On re-examination in September, 1942, the patient had returned to work, but was showing mild mental symptoms. Spinal fluid protein was 40, cells 4, Wassermann reaction negative with 0.5, doubtful with 1 c. c., colloidal gold 1232100000.

Case 176370.—A white man, aged 38, was admitted February 6, 1942, with a history of irregular antisyphilitic therapy since April, 1941. Marked deterioration was evidenced by violent behavior and confusion, symptoms having been present for approximately three months. Spinal fluid protein was 75, cells 30, Wassermann reaction positive with 0.2 c. c., colloidal gold 5543210000. Chemotherapy and twelve fever bouts (50 hours over 101°, 21 hours over 103.6°, 6 hours over 105°) were given with no immediate improvement, the patient being transferred to a mental hospital for care and further chemotherapy. In October, 1944, this institution reported that the patient was moderately improved, had been given quiet quarters and privileges, but was not yet ready for discharge.

Case 168697.—A white man, aged 41, was admitted February 23, 1942, with mild symptoms of parésis present for eleven months. Chemotherapy had been given during the preceding year. Spinal fluid: protein 100, cells 11, Wassermann reaction positive with 0.2 c c., colloidal gold 5554433100. Chemotherapy and seven bouts of fever (30 hours over 101°, 15 hours over 103.6°, 7 hours over 105°) were followed by fairly regular treatment on discharge. In August, 1944, the patient was asymptomatic and working in a factory. Spinal fluid: protein 35, cells 0, Wassermann reaction negative with 0.1 c. c., positive with 0.5, colloidal gold 2344311000.

Case 188906.—A white man, aged 44, was admitted March 29, 1943, with symptoms of paresis for one month. He had received antisyphilitic treatment since December, 1942. Fluoroscopic examination revealed early aortitis. Spinal fluid examination: protein 150, cells 16, Wassermann reaction positive with 0.2 c. c., colloidal gold 5554321000. The patient was given chemotherapy and 12 bouts of fever (58 hours above 101°, 25 hours above 103.6° and 10 hours above 105°). On discharge, he continued regular treatment and has been working regularly as pilot. In October, 1944, the patient was asymptomatic. Spinal fluid: protein 60, cells 0, Wassermann reaction negative with 0.1, positive with 0.5 c. c., colloidal gold 2233110000.

Case 189989.—A white man, aged 32, was admitted on April 29, 1943, with a history of having taken irregular antisyphilitic therapy since 1936. During the previous year, he had had mental symptoms, necessitating sanitarium care, and had been given four bouts of fever elsewhere with slight improvement. On examination, the patient was verbose and hyperactive. Spinal fluid: protein 60, cells 13, Wassermann reaction positive with 0.2 c. c., colloidal gold 5554322100. Chemotherapy and ten bouts of fever (73 hours above 101°, 36 hours above 103.6°, 17 hours above 105°) were administered and regular therapy was continued after discharge. In April, 1944, the patient was readmitted because of an acute infectious arthritis which had necessitated discontinuing work. His mental status was good except for a moderate verboseness. Spinal fluid: protein 30, cells 2, Wassermann reaction negative with 0.1 c. c., positive with 0.5 c. c., colloidal gold 4432210000.

Case 179378.—A white man, aged 39, was admitted on May 18, 1942, with a severe paranoid paresis of approximately one month's duration. No history of previous treatment could be elicited. Spinal fluid: protein 90, cells 55, Wassermann reaction negative with 0.2, positive with 0.5, colloidal gold 5554431000. Chemotherapy and ten bouts of fever (38 hours over 101°, 12 hours over 103°, 4 hours over 105°) were administered with no immediate improvement and the patient was transferred to a mental hospital for further chemotherapy until December, 1942, when he was discharged. In November, 1943, it was reported that he had resumed work and that his spinal fluid was normal.

Case 183310.—A white man, aged 34, was admitted on September 27, 1942, with mental deterioration of one year's duration. His infection had been contracted in 1931 and was followed by irregular treatment for six months. In 1933, epileptiform seizures occurred and a "brain tumor," pathologically reported as gumma, was removed elsewhere. Residuals of a right hemiplegia followed this surgical procedure. Six months later, the patient developed a secondary eruption and irregular chemotherapy was carried out for several years. Spinal fluid revealed protein 75, cells 27, Wassermann reaction positive with 0.2 c. c., colloidal gold 5433100000. Intensive chemotherapy and ten bouts of fever, carefully controlled because of the skull defect, were administered (65 hours above 101°, 30 hours above 103.6°, 8 hours above 105°). The patient continued regular therapy on discharge, and in October, 1944, his mental status had shown slight but definite improvement. Spinal fluid examination: protein 20, cells 0, Wassermann reaction negative with 0.1 c. c., doubtful with 0.5, positive with 1 c. c., colloidal gold 2222000000.

Case 195356.—A white man, aged 34, was admitted October 10, 1943, with the history of irregular treatment for syphilis since 1933. Definite symptoms of mental deterioration had been present for six to eight months. Spinal fluid examination: protein 40, cells 8, Wassermann reaction negative with 0.2 c. c., positive with 0.6 c. c., colloidal gold 5533300000. Intensive chemotherapy and twelve bouts of fever (43 hours over 101°, 40 hours over 103.6°, 9 hours over 105°) were given in two episodes because a mild hypoproteinemia developed. Regular therapy has been continued and the patient has resumed work at preparetic level, with marked improvement in his status. Spinal fluid examination in July, 1944: protein 30, cells 10. Wassermann reaction negative with 0.5 c. c., positive with 0.1 c. c., colloidal gold 4333210000.

RESULTS

A summary is presented of the findings and results in 19 patients with acquired paresis treated by triple typhoid vaccine and chemotherapy from 1939 through 1943. Eighteen

patients were male, one was female; all were white. The ages varied from 29 to 54 years, the average age being 39. Mental symptoms of less than six months' duration were present in 7 and were of longer duration in 12. These cases have been followed from 8 to 52 months.

The average number of fever bouts per individual was ten. In this group of patients, except for those treated during 1943, no attempt was made to insulate during fever; in 1943 blankets and hot water bottles only were used. During 1944, although no patients are reported because of the inadequate period of follow-up, the described cradle and light technic has been developed, so that the total hours of fever are definitely prolonged.

The following table demonstrates these average increases in both height and duration of temperature obtained on each patient.

HOURS OF FEVER
(Average—10 bouts)

Year	101° F.+	103.6° F.+	105° F.+
1939-1942	47.6	17.3	5.6
1943	58.0	33.0	12.0
1944	60.5	44.5	30.0

Table 2

A total of approximately 90 patients, under our observation and including the series reported in detail, has been treated with hyperpyrexia induced by intravenous triple typhoid vaccine. About 750 episodes of fever have been given and in this group untoward reactions have been of minor nature with the exception of the following case. A fatality occurred in a white man, aged 40, with moderately advanced paresis and a hypertension of 175/92. An excessive amount of vaccine was given inadvertently when the patient's temperature was elevated to 101° F.; "heat stroke" developed with death on the same day. Permission for autopsy was refused.

A summary of clinical results in the 19 patients with paresis is reported:

(1) 57.9 per cent or 11 patients are greatly improved and have been returned to their pre-paretic level.

(2) 26.3 per cent or 5 patients are improved. The majority have returned to work at levels lower than formerly, but have shown a fair social adjustment. One patient is institutionalized but is improving and will soon be discharged.

(3) 15.8 per cent or 3 patients are unimproved or have shown progression.

84.2 per cent or 16 of the 19 cases have, therefore, shown either marked or moderate improvement clinically. The details of the spinal fluid changes are included in the individual case reports.

SUMMARY

A simple technic, using single or double dose intravenous foreign protein and blanket-pack insulation, to produce hyperpyrexia is described. Results when combined with chemotherapy in a small series of cases are reported.

REFERENCES*

1. Kemp, J. E.; and Stokes, J. H.: Fever Induced by Bacterial Proteins in the Treatment of Syphilis. J.A.M.A., **82**:1737 (May 25) 1929.
2. Kunder, Margaret M.; Hall, G. W.; and Gerty, J. F.: General Paresis: The Effect of Non-Specific Protein Therapy on the Blood and Spinal Fluid. J.A.M.A., **89**:1304 (Oct. 15) 1927.
3. Nelson, M. O.: An Effective Method of Protein Fever Treatment in Neurosyphilis. South. M. J., **26**:424 (May) 1933.
4. Barksdale, E. E.: Personal Communication.
5. Simpson, W. M.; Kendell, H. W.; and Rose, D. L.: Supplement No. 16 to Venereal Disease Information, 1942.
6. Moore, J. E.: The Modern Treatment of Syphilis. Springfield, Ill.: Charles C. Thomas, 1944.
7. Simpson, W. M.; and Bierman, W.: Fever Therapy. New York, N. Y.: Paul B. Hoeber, Inc., 1937.
8. Dattner, B.: The Management of Neurosyphilis. New York, N. Y.: Grune and Stratton, 1944.
9. Knight, H. C.; Emory, M. L.; Flint, L. D.: Method of Inducing Therapeutic Fever with Typhoid Vaccine Using the Intravenous Drip Technique. Venereal Disease Information, **24**:323 (Nov.) 1943.
10. Jones, N.; Hundley, J. L.; Walker, A. E.; Carpenter, C. M.; Warren, S. L.; Hanson, H.: Further Observations on the One Day Treatment of Syphilis with Fever and Mapharsen. In press.
11. Thomas, E. V.; and Wexler, G.: Combined Fever and Arsenotherapy in Intensive Treatment of Early Syphilis. J.A.M.A., **126**:550 (Oct. 28) 1944.

DISCUSSION (*Abstract*)

Dr. Harry M. Robinson, Baltimore, Md.—The large percentage of satisfactory results which Drs. Smith, Shafer and Crutchfield have obtained in central nervous system syphilis by means of combined fever and chemotherapy is striking and if these results can be duplicated by others using the same technic the value of the work will be beyond question.

*No attempt is made to cite the voluminous literature on the subject of fever therapy. A complete bibliography is available from the above references.

As of today, fever therapy, whether by malaria, foreign protein (that is, typhoid vaccine) or the hypertherm, is the one method of treatment of late central nervous system syphilis which is preeminent in its benefits. It is superior to chemotherapy with trivalent or pentavalent arsenical compounds or so far as is now known, to penicillin.

My experience impels me to believe that while chemotherapy is probably imperative for the treatment of syphilis of the central nervous system because of syphilis in the rest of the body, I am not convinced that either trivalent or pentavalent arsenical compounds are important factors in the control or "cure" of late central nervous system syphilis either during or after the induction of fever.

At the University of Maryland Hospital in conjunction with other Baltimore hospitals we have been able to keep a quartan and tertian malarial strain active and available; therefore, in most of our patients this method of fever therapy has been employed.

There have been occasions, however, when the induction of fever by malaria has been contraindicated or undesirable for various reasons and in such instances we have given intravenous injections of killed typhoid bacteria (typhoid vaccine).

As Drs. Smith, Shafer and Crutchfield have pointed out, the height and frequency of the temperature "spikes" or "peaks" can usually be controlled without danger to the patient. Like these investigators, we use "step ladder" injections. We begin with 20 million killed organisms. As the average typhoid vaccine contains 1000 million typhoid organisms per c. c., it is necessary to dilute 0.1 c. c. to 5 c. c., and 1 c. c. of this will then equal 20 million organisms. The number of organisms is doubled each day and two or three injections are given per day as required. In order to attain a temperature of 105° F., I have frequently had to give three injections a day; as for instance 20 million at 10 a.m., 20 million at 12 noon, and 20 million at 2 p.m. The next day the injection would be 40 million at each of these periods, and so on. I have aimed at 12 to 15 bouts of fever totalling 50 hours of fever at 104° F. and over. By the time of the seventh injection, undiluted vaccine is used at each injection and by the eleventh day of fever 20 c. c. whole vaccine is used two or three times a day. This vaccine can be obtained at any state or city health department. I would give a note of warning that this method is not fool proof. If for instance a day or two is missed in the course of the administration of the vaccine, it is unwise to double the amount of the previous injection or even to give the same amount as that of the preceding injection, if that injection has been the second, third, or more in the series. In two such instances in which this was done, the temperature in each case rocketed to over 106° F. on the first injection of that day, and each patient went into shock.

As Drs. Smith, Shafer and Crutchfield have shown, complete remissions of paresis can be obtained by fever therapy properly used. Fever therapy is also indicated in patients with non-paretic neurosyphilis in whom the spinal fluid shows a definite increase in the lymphocytes, protein content, and globulin, and especially if there are clinical signs of central nervous system involvement.

If, as I said before, the results of this method of concurrent fever and chemotherapy advocated by these authors can be duplicated in a large series of patients followed for a longer period of time, it may be more desirable than fever alone. Whether, however, fever is used alone or combined with chemotherapy, patients with central nervous system syphilis are always urged and warned to return every six to twelve months for a reexamination of the spinal fluid for the rest of their lives.

Dr. A. Benson Cannon, New York, N. Y.—I think that we all will agree with Dr. Smith and his collaborators as to the beneficial results obtained in the treatment of syphilis with fever therapy. As the authors have pointed out, fever is of particular value in the treatment of some forms of neurosyphilis, such as paresis. There are, however, people who still argue as to the relative value of fever produced by different methods: malaria, foreign protein, and mechanical. Wagner-Jauregg in his last publication on the subject (1939) said that in his opinion there was no difference in the fever produced by one method or another so long as constant factors were used. At the Presbyterian Hospital in New York, Dr. Snow compared the results of some two thousand cases of neurosyphilis treated mechanically with those of a similar number treated with malaria, and as a result of his observations he said that he favored the mechanical method. He gave as his reasons for this opinion that mechanical methods can maintain a more even temperature, that one can use chemotherapy at the same time, and that furthermore one does not introduce a foreign substance into the system as in the case when malaria and typhoid vaccine are used. He found, moreover, that mechanically treated people were not left in a lowered state of health. On the other hand, Dr. Smith and his co-workers have called attention to the accessibility of typhoid vaccine, its convenience, the simplicity of the technic of administration, and the relatively low cost of the treatment. He further says that the expense of the fever machine, the trained personnel necessary for its operation, and the expense of the treatment are factors that could not be overcome in the majority of small institutions. Certainly one does find that the number of cases that can be treated with the fever machine is limited and that the cost is very great.

The authors have largely overcome the question of maintaining constant temperature in their patients by an ingenious method of insulation of the patients with rubber blankets, and by the use of hot water bags: factors that have undoubtedly added greatly to the effectiveness of the method of treatment.

In a careful analysis of the 19 case reports contained in the paper, I noticed that only one patient received as much as 55 hours total, and a second patient 49 hours total, of a temperature over 103° F. The others varied all the way down to only 2 hours total of a temperature over 103°, the general average being a

bit lower than 25 hours total. I think that this is important inasmuch as Dr. Snow has found that if one maintains a constant temperature of over 103° for a minimum of 60 to 90 hours, one can expect an eighty per cent improvement in all types of neurosyphilis, either in symptoms or serologic findings, or both. From a study of the amount of fever which the authors have given to their patients each year from the beginning in 1939 and inclusive of 1944, it may be seen that they have gradually increased the total number of fever hours above 103° in each successive year so that in 1944 their patients were receiving as high as 75 hours total of a temperature above 103°. I am highly enthusiastic over Dr. Smith's method of treatment. With the knowledge which he has gained by his study he will in all likelihood be able to step up the total number of fever hours above 103° without too much delay. Undoubtedly with this greater total number of hours of high fever he will find a corresponding improvement in the symptoms of his patients.

I have long been an advocate of tryparsamide in the treatment of parenchymatous neurosyphilis of the paretic type. I had the opportunity of giving the drug under the supervision of the late Dr. John A. Fordyce when it was first given to him by the Rockefeller Institute for experimental purposes, and I have never found occasion to change the favorable report submitted at that time. I have seen long remissions produced in paresis cases treated with tryparsamide where all other forms of medication had failed. More often patients gain in weight and in general health and well being with remissions in their symptoms comparable to those obtained with malaria.

Again I am not certain that it is necessary to precede fever therapy by 6 months of chemotherapy thereby losing valuable time. Furthermore, such treatment interferes with the proper appraisal of the fever. I do believe that a man would be better able to evaluate the effect of fever if he used that alone. I have seen patients become serologically negative as long as five years after having received malaria, who have had no medication in the interval. While it may be theoretically advantageous to treat the patient with arsphenamine and a heavy metal following fever therapy, I am not quite convinced that such a procedure is necessary. I feel as Dr. Smith does that we should take no chance, and treat the patient with chemotherapy in addition to the fever.

I wish to compliment Dr. Smith, Dr. Shafer and Dr. Crutchfield on their several years of splendid work. I think they have done a great service in making available a perfected technic in the use of a foreign protein to produce fever in the treatment of syphilis.

Dr. M. F. Engman, Jr., St. Louis, Mo.—In 1915 to 1917 Doctor Engman, Sr., became interested in fever therapy which at that time was relatively new. He used typhoid vaccine intravenously and treated a number of different skin diseases, including early syphilis. Some of this work was published. In 1930 Engman, Sr., Jorstad and I conducted a study of early syphilis with various forms of non-specific therapy including typhoid vaccine intravenously. This work was also published in the *Journal of the American Medical Association*. We put the patients on a high carbohydrate diet as we felt that this minimized the untoward reactions, gave them iodides by mouth, typhoid vaccine intravenously producing fever from 102 to 105°. At the height of the fever we gave bichloride of mercury intravenously. We had some encouraging results but were unable to complete the experiment.

Dr. Richard L. Sutton, Kansas City, Mo.—I had the privilege of seeing Dr. Smith's work on his home grounds, and I was struck particularly with his ingenuity in meeting the problem of delivering adequate fever treatment with simple means and means that appeared relatively safe. The agent used does not produce anemia as malaria does. I think it will interest you to know how his fine temperature charts with their sustained fevers compare with the results one obtains with malaria.

At Woodrow Wilson General Hospital, Staunton, Virginia, we are using malaria therapy according to the directive in dealing with neurosyphilis. In twenty cases each given 10 bouts with P. vivax (McCoy strain) the number of hours during which rectal temperature equalled or exceeded 103° F. was 67.5. Rectal temperature equalled or exceeded 104° F. for 49 hours, 105° F. for 28 hours, and 106° F. for 7.3 hours.

Using P. malariae (Trinidad strain), the figures, for ten or eleven bouts, were 64 hours at 103° F. or over, 38.3 hours at 104° F. or over, 16.7 hours at 105° F. or over, and 2.4 hours at 106° F. or over.

Dr. Smith can duplicate or perhaps improve on our figures with his method of administering fever therapy. This leads me to believe that his is an excellent idea indeed for consideration and use elsewhere.

Dr. Smith (closing).—Some of the opinions expressed in this paper are, we realize, not universally accepted. Preliminary or prefever chemotherapy results in a disappearance of the inflammatory changes in the brain and other parts of the neural axis and this, we think, is desirable. We feel that "the shock-protein reaction" is a very important therapeutic factor.

In mechanical fever with cabinets, one gets only a rise in temperature. In malaria, there occurs a rise in fever and foreign protein reaction with the harmful effect of debilitation. During the last several years reports have indicated that mechanical fever and malaria are about equivalent in final results. The comparison in these methods has not always been logical. The total number of hours of high fever, using mechanical methods, has exceeded the same rises by other methods. With the method here described, we have available a method for producing prolonged high fever, foreign protein reaction, freedom from the untoward reactions associated with malaria and an opportunity to intensify chemotherapy.

Individual patients continue to show improvement for some period of time after fever therapy, but a certain percentage of these will relapse unless regular antisyphilitic treatment is continued.

PENICILLIN IN THE TREATMENT OF SYPHILIS AND GONORRHEA*

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When one looks back over the years and specifically notes therapy aimed at treating the so-called venereal, or genito-infectious diseases, he cannot help being struck by the fact that "cures" have been legion. Drugs, drugs, and still other drugs have been introduced in an effort to help mankind, which from early times has suffered from these dread diseases. Apparently, we now stand on the threshold of a new era, and have in our grasp another in a long series of drugs, which seems to be a boon to mankind.

We have been asked to discuss here in a short period of time the treatment of gonorrhea and syphilis with penicillin. Obviously, one cannot here cover this many faceted subject thoroughly, even in part. It is impossible to discuss types of therapeutic regimen, subjective symptoms and laboratory findings. Therefore, it seems proper that we present here for your consideration a brief summary of the work with this drug which was done during this year. All cases herein mentioned were treated at the Mid-Western Medical Center, a United States Public Health Service rapid treatment hospital. This material is presented through the courtesy of the U. S. P. H. S. and Senior Surgeon Leland J. Hanchett, Medical Officer in Charge.

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MALE GONORRHEA

From March 15, 1944, to September 15, 1944, 100 sulfa-resistant and acute male gonorrhea patients were treated with penicillin. The initial course of penicillin was 150,000 units. Another supplemental course of 150,000 units was administered to the failures. Of the 100 patients treated following one course of 150,000 units of penicillin, 12 per cent were failures and 88 per cent rendered culturally negative. A supplemental course of 150,000 units of penicillin on the above 12 per cent resulted in 4 per cent failures, or 96 per cent cured, with two courses of penicillin. These 4 per cent failures were rendered culturally negative with a 300,000 unit course of penicillin.

SUMMARY

(1) A 150,000 unit initial dose results in about 12 per cent failures. A careful observation by cultures and clinical observation will disclose these failures and points out the value of a careful follow-up.

(2) Of the failure group, all should respond favorably to a second course of 300,000 units of penicillin.

(3) In a hospital of this type, it is impossible at times to differentiate a relapse from a reinfection. This should be kept in mind.

FEMALE GONORRHEA

Now let us look at the far more difficult problem of gonorrhea in the female: Two hundred and seventy-one cases of female gonorrhea were treated in the period, April 15, 1944, to September 15, 1944; 171 cases had an adequate follow-up of three or more cultures. The initial course of penicillin was 150,000 units. Of the 171 cases, 13 per cent were treatment failures (35 cases). Of this 13 per cent, 15 cases received an additional 150,000 units; seven cases received 300,000 additional units; 10 cases received varying amounts up to 750,000 units. This latter group of persistently positive cultures was submitted to sugar fermentation tests; 58 tests were run, but only 21 were run to completion, 37 being incomplete.

Dr. Thayer, bacteriologist, U. S. P. H. S. experimental laboratory, gave the following reasons why many cultures were lost: (1) Too

many were planted on one plate; (2) inferior media and too many contaminants. This can be helped by using Supplement A, or changing the type of Media T. (3) One should be careful about using prepared sugar media or making too large a quantity at one time with consequent loss of moisture.

Of the 21 cases, only nine were shown to be positive for gonorrhea and 12 were false positive reactions; 60 per cent of the failures were culture false positives, and not treatment failures. Therefore, approximately 94 per cent of the cases of female gonorrhea can be considered as cured, at least clinically, and by laboratory standards.

SUMMARY

(1) In female gonorrhea the problem is more difficult because of the anatomic structures involved and the prevalence of a mixed bacteriological flora.

(2) Apparently 22 females were treatment failures on 150,000 units initial dose (13 per cent).

(3) Of the above group, nine patients were found to have positive cultures after sugar fermentations.

(4) Twelve patients had false positives, according to sugar fermentation.

(5) Many women fail to show marked clinical improvement following penicillin therapy. There is a discrepancy between clinical and cultural evidence which brings up the problem of whether other members of the Neisserian group are not pathogenic to some degree.

SYPHILIS TREATED WITH PENICILLIN

We have treated to date approximately 125 cases of syphilis. Of these, only 63 cases have had an adequate follow-up and observation, so that in discussing our results only the latter group can be considered. All of these patients have had 2,400,000 units of penicillin administered: 40,000 units per dose, every three hours intramuscularly.

Of the 63 cases treated with penicillin, 16 (or 25.4 per cent) are now entirely negative. Six of this group, however, were darkfield positive seronegative cases, which have remained negative during their follow-up period. Thirty-nine patients (61.9 per cent) show a progressive drop in serologic titre, or are "almost negative" with a negative Wassermann and doubtful positive Kahn. Eight patients (12 per cent) demonstrate no appreciable drop in serologic titre. Of this group, three have definite infectious relapses (3.2 per cent). We, therefore, may see that in these 63 patients, 55 are either negative at this time or will probably reach negativity in the future. As we might expect, the great proportion of the serologic reversals fell in the darkfield positive seronegative and early secondary group. Our experience in treating latent and central nervous system syphilis with penicillin is limited.

Our congenital and early acquired syphilitic group of babies offers a most interesting investigative problem. Twelve babies, or young children; nine congenital and three acquired syphilitics, were treated with 500,000 to 1,800,000 units of penicillin. The varying amount of penicillin used was governed by (1) an attempt on our part to work out a dose-weight relation, and (2) the extreme scarcity of penicillin at that time. Many times we felt the patient should have had larger doses of penicillin, but it was not available.

We feel that our results are good. The quantitative Kahn units in all but two of these babies dropped markedly in the first month after treatment. One congenital syphilitic is entirely negative at seven months after treatment. A second congenital syphilitic is a doubtful negative at seven months after treatment. All of the babies have made significant drops in their quantitative Kahn units. The lesions of congenital syphilis have healed rapidly. The long bone involvement which many congenital syphilitics evidence has shown healing, and outside of some residual thickening in several cases, shows almost complete resolution.

Treatment efficacy with penicillin is evidenced by (1) disappearance of spirochetes in cutaneous lesions in 6 to 48 hours; (2) a Herxheimer type reaction occurring soon after the initial doses of penicillin; (3) a rapid and progressive drop in serologic titer in the majority of cases in four and a half to six months.

The fact that the toxicity of the drug is very low, or almost nil, makes it of the utmost value

in treating those individuals who are debilitated, or show a sensitivity to arsenic and heavy metal. It should be a boon in the treatment of syphilis in children.

We have had three infectious relapses. Two were in seropositive primary cases which received the full course, 2,400,000 units of penicillin. Both of these occurred three and one-half months after treatment. A third infectious relapse occurred in a patient with secondaries, given a full course of treatment, two months after treatment.

We have no doubt we shall find patients who do not respond favorably to treatment with penicillin. As with all other new drugs, time to observe the progress of the patient after penicillin is of utmost importance.

We do not know as yet whether "seroresistance," or "drug fast" states, can be produced by improper usage of penicillin. The optimim dosages of penicillin will change with the disease and within the disease. We wish to point out that penicillin is not to be "poured on like water." Careful selection of patients and attention to detail in patient work-up is of great importance.

It is our feeling that penicillin will be a valuable adjunct to the armamentarium of the practitioner when he learns to use it correctly in the treatment of these scourges of mankind.

THE MANAGEMENT OF BREECH PRESENTATION*

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and
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The majority of the cases on which we base our discussion were taken from the department of obstetrics and gynecology of the University of Louisville at the General Hospital. The remainder were taken from the private practice of one of the authors (R.F.V.). The frequency with which we have seen breech presentation corresponds to the figures presented by most clinics.

Breeches are certainly not desirable but our experience with external versions has not been too satisfactory. In the majority of our cases no routine efforts have been made at conversion to a vertex since most of these cases have been used for teaching purposes.

When possible, external version should be done to insure the lower fetal mortality of a cephalic presentation. However, a good many breech presentations seen at prenatal visits during the seventh month will rotate spontaneously. After this period we have found external version more difficult especially in primiparae.

In the past 4½ years we have had a total of 224 single breech presentations that have delivered after the time of viability. Additional cases of multiple pregnancies with breech presentation are not included in these figures.

In this paper we are going to try to bring out the value of extraction as soon as possible, after complete dilatation of the cervix. This technic was first advocated by Irving and Goethals[1] in 1926.

Our cases have been separated into primiparae and multiparae and we have determined the average length of the first stage in each group. We have also determined the average length of the second stage for the entire group, since we have attempted to obliterate the second stage regardless of parity.

The average length of the first stage in primiparae was 15.16 hours and in multiparae 10.85 hours. The average length of the second stage in both groups was 33 minutes which is considerably shorter than when spontaneous delivery is allowed to take place as practiced by some clinics.

There were 113 primiparae and 111 multiparae. Of this total of 224 patients, 177 were delivered by extraction as soon as the cervix was completely dilated. Twenty-three were given assistance after spontaneous delivery to the umbilicus. Twenty-five patients delivered

*Read in Section on Obstetrics, Southern Medical Association, Thirty-Eighth Annual Meeting, St. Louis, Missouri, November 13-16, 1944.

completely spontaneously. After coming head forceps were used in 136 cases.

The types of breech occurred as follows: frank breeches 122, footling 51, full breeches 12, incomplete 5 and undetermined 34. There was a total of 30 fetal deaths. Of these, 11 were premature, 5 were macerated stillborns, 5 had conditions incompatible with life (patent foramen ovale, spina bifida, hydrocephalus, anencephalous) and nine were in full term babies.

The gross fetal mortality was 13.39 per cent. Subtracting the macerated fetuses and conditions incompatible with life, the corrected mortality was 9.34 per cent. Subtracting the premature deaths, (3 weighed between 2 and 3 lbs., 6 weighed between 3 and 4 lbs. and 2 weighed between 4 and 5 lbs.) the final corrected mortality for full term uncomplicated breech presentation was 4.43 per cent. The final corrected mortality showed 6 deaths in term primiparae for a mortality of 5.94 per cent and 3 deaths in term multiparae for a mortality of 2.94 per cent. An analysis of these term deaths shows that two were the result of prolapse of the cord during the first stage of labor. In 4 cases there was some disproportion between the head and the pelvis. This disproportion was at the outlet in 3 cases and at the inlet in the fourth. Two deaths occurred in patients who had very easy extractions. No causes for death could be found. One case had a very long first stage (51 hours); the fetal heart tones stopped during first stage and the baby was stillborn.

There were 12 cases of prolapse of the umbilical cord. Of these, three resulted in stillborns and nine in living births.

The authors as well as the other members of our department believe in close observation of a breech presentation during labor. Both the ward and private patients have been checked more carefully with this condition prevailing and the ward patients have been delivered by or under supervision of a resident of 3 to 5 years' training. This precaution includes careful checking for disproportion with most of the primiparae being x-rayed. The method of x-ray pelvimitry used was that presented by one of the authors (W.T.M.) in a paper[2] before this group in 1939.

The care during the first stage of labor is made up of frequent observation of the progress, keeping in mind the value of intact membranes, until dilatation is complete, when possible. This is stressed because of the frequency of intracranial hemorrhage as the cause of death in breech presentation, even in the absence of difficulty with extraction. With rupture of the membranes, immediate examination should be done to rule out the presence of prolapse of the cord.

As soon as dilatation is complete, the patient is prepared for delivery. She is then catheterized, examined, and if complete dilatation of the cervix is confirmed, she is then put under deep anesthesia. In all primiparae and in those multiparae where the perineum offers resistance, an episiotomy is done before any attempt at delivery is made. It is not only easier to do at this time, but it prevents a delay in progress of the delivery at a later stage and facilitates the delivery of both the shoulders and the head.

In case of a frank breech where the feet are on the mother's right, the left hand is introduced and using Pinard's maneuver, the legs are flexed and the feet are grasped and brought down to the vulva. If the baby's feet are on the mother's left, then the opposite hand is used. Traction is made on the feet until the hips appear. The thighs are then grasped with the fingers and the thumbs are placed over the buttocks, and traction is made in a downward direction as long as there is progress. With arrest of progress, the trunk of the baby is rotated through a 180 degree arc, bringing one of the scapulae under the pubic arch. If this is not accomplished rotation in the opposite direction is performed. In difficult cases it may be necessary to change the direction of rotation several times to accomplish delivery of the shoulders.

The anterior arm is delivered by introducing two fingers over the shoulder splinting the humerus and sweeping the arm over the baby's chest wall. The posterior shoulder is rotated anterior and the second arm is delivered in a similar way. After this, no further traction is made. A hand is introduced into the vagina and the head is brought into the pelvis and flexed, by making pressure over the malar processes

along with suprapubic pressure by the other hand of the operator. The chin is placed in midline. The body is then elevated by an assistant, and forceps are applied to the after coming head. The baby is then lowered and traction is applied in the direction of the outlet of the pelvis, delivering the head.

A large percentage of the difficulties in delivering the head arise from failure to bring the head down into the pelvis and getting the chin in the mid-line. These are important steps in a successful delivery. In the other types of breech, the feet are grasped and pulled down and the delivery proceeds as we have described.

DISCUSSION

We wish to emphasize several points in our description of the breech delivery. We stated that the patient was prepared for delivery when complete dilatation was obtained. We feel that this procedure has reduced our mortality by early diagnosis of prolapse of the cord, prevention of pressure on the cord as the buttocks comes through the pelvis, as well as preventing the fundus from contraction forcibly against the head during a longer second stage. Also, it is easier to break up a frank breech before it becomes deeply wedged into the pelvis.

Success of the delivery often depends upon the proper preparation for delivery. This includes good deep anesthesia, early episiotomy, and forceps available for the after coming head. We do not feel that any special type of forceps is necessary and use frequently the instruments that we use for outlet extractions.

A factor that is frequently mentioned in descriptions of breech deliveries is the time element. We have never felt that there should be a time limit for delivery after the umbilicus appears, but it is needless to say that the baby should be delivered as quickly as is safely possible.

As demonstrated by these cases, disproportion at the pelvic outlet is difficult to anticipate and frequently is a factor in the fetal mortality. This represented 50 per cent of the fetal mortality in uncomplicated term primiparae in our series.

CONCLUSIONS

(1) Two hundred twenty-four cases of single breech presentations delivering after the time of viability were reviewed.

(2) The average length of the first stage in primiparae was 15.16 hours and in multiparae was 10.85 hours.

(3) The average length of the second stage for the entire group was 33 minutes.

(4) An attempt was made to obliterate the second stage of labor.

(5) The final corrected mortality for full term uncomplicated breech presentation was 4.43 per cent.

(6) Disproportion at the pelvic outlet accounted for the largest single factor in our fetal deaths in uncomplicated term pregnancies.

REFERENCES

1. Irving, F. C.; and Goethals, T. R.: Am. J. Obst. & Gynec. **11**:80-88, 1926.
2. McConnell, W. T.: Sou. Med. Jour., **32**:770 (July) 1939.
3. Caldwell, W. E.; and Studdiford, W. E.: Am. J. Obst. & Gynec., **18**:623, 1929.
4. Macafee, C. H. G.; and McClure, H. I. A.: Brit. M. J., No. 4013, Dec. 4th, 1937.
5. Rucker, M. P.: Proc. First Am. Congress Ob. and Gynec., 1939, 310.

DISCUSSION (*Abstract*)

Dr. J. Milton Singleton, Kansas City, Mo.—Have you had the misfortune of having any depressed fractures of the skull with the use of forceps on the aftercoming head? We had this misfortune in our hospital recently in two cases, where the blades were forced to produce a depression as they passed the spines. Both cases had complete recovery, one without and one with operative correction. One case had had thorough x-ray volumetric measurements of the pelvis and aftercoming head; the other was an emergency requiring version and extraction from neglected transverse presentation. The disproportion in each case was the level of the spines. What anesthetic do you use?

Dr. Vogt.—The disproportion at the outlet that we encountered was in most cases of mild degree. At times it was more than anticipated with an unmolded head. Occasionally in these cases there was some slight error in diagnosis, or failure to recognize a contraction of the outlet, until it was too late. But regardless of that, we were able to deliver all of these cases without any depressed fractures, some of them with difficulty, and some of them resulting in fetal death and neonatal fetal death. A few babies were revived and lived for two or three days. These are counted against our mortality.

In almost every case of breech extraction we use ether or a combination of cyclopropane and ether. We have

found that cyclopropane does not give us sufficient relaxation to do an early breakup of a frank breech, the thing that we have tried to present in the paper. Most of these patients have been induced with cyclopropane, and then carried to a fairly deep third plane of anesthesia with ether.

Dr. H. H. Ware, Jr., Richmond, Va.—Will you give us again your uncorrected stillbirth and neonatal death rate for babies weighing five pounds or more?

Dr. Vogt.—Of the entire group, we had a mortality rate of 13 per cent. Of those 30 babies, 11 weighed less than five and a half pounds, so that a little more than one-third of our mortality, of the entire mortality, was made up of premature babies. That has been the experience of most of the large series of breech presentation, that prematurity represents the largest factor in the mortality, so that our uncorreced mortality, subtracting just the prematures, would be something like 8 per cent. To be specific, it is 8.48, I think.

FACTORS INFLUENCING THE MORBIDITY AND MORTALITY RATES IN GYNECOLOGIC SURGERY*

BASED ON AN ANALYSIS OF FIVE HUNDRED CONSECUTIVE CASES IN PRIVATE PRACTICE

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Exactly nine years ago, in St. Louis and before this same Section of the Southern Medical Association, I reported, with T. B. Sellers, 1,000 consecutive gynecologic operations from our private practice, with particular reference to the 2.7 per cent incidence of major postoperative complications and the gross case fatality rate of 1.8 per cent.[1] The corrected case fatality rate of 0.9 per cent was arrived at by deducting from the 18 deaths in the series five deaths caused by generalized peritonitis present before operation, three deaths due to carcinoma, and one death due to purpura hemorrhagica.

At this time I am reporting, for comparative purposes, the last 500 consecutive gynecologic operations in our private practice, with particular reference to the 2 per cent incident of major postoperative complications and the case fatality rate of 0.2 per cent. The incidence of major complications is lower in this second series than in the first, though our criteria are considerably stricter at the present time, and the case fatality rate is also lower. Both decreases, I believe, are due to more careful preoperative and postoperative preparation, including the use of measures which either had not been introduced at all at the time of our first report, or which, if in use, were not employed as generally as they are at the present time.

Because gynecologic surgery is chiefly elective, the surgeon's responsibility in respect to both morbidity and mortality is heavier than in other varieties of surgery. In the majority of instances the patient is suffering from a condition which, although it may vary from annoying to incapacitating, is not incompatible with life, and frequently is not incompatible with a fair degree of comfort and working ability. To no variety of surgery, indeed, is Moynihan's axiom more applicable:

"Surgery has been made safe for the patient; we must now make the patient safe for surgery."

The basis of the patient's safety is fourfold: (1) careful preoperative preparation, as a prophylaxis against organic and functional derangement after operation; (2) the selection of an anesthetic best suited to the individual patient; (3) the selection of the operative procedure with sound surgical judgment, and the institution of protective measures while it is in progress; (4) careful postoperative therapy. These factors, of course, are exclusive of, and in addition to, a careful history, a thorough physical examination, and the performance of routine and special laboratory tests, the former being indicated in every case and the latter being selected on the ground of their necessity in the individual case.

PREOPERATIVE CARE

The preoperative preparation of every patient should include:

(1) An appraisal of the competency of the heart and circulatory system, including consultation with, and direction of therapy by, a competent internist as indicated. Anesthesia, how-

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*From the Southern Baptist Hospital.

ever skilfully administered, and surgery, however dextrously performed, place a strain upon the cardiovascular apparatus, and minor degrees of incompetency may lead to major disasters if the proper precautions are not taken.

(2) An appraisal of the competency of the respiratory system on the same general principles. A subsiding upper respiratory infection may again become progressive, a quiescent lung lesion may be reactivated, and an active lung lesion may be exacerbated by anesthesia and surgery if they are unrecognized before operation, and if anesthesia and surgical procedure are not chosen on the basis of their existence.

(3) An appraisal of the competency of the urinary system on the same general principles. This study should include the chemical and microscopic examination of a catheterized specimen of urine, and the performances of blood chemical determinations and of tests of renal function in all patients who show the slightest evidence of renal dysfunction.

(4) An estimate of hepatic function, with serial determinations if the initial test shows impairment of function, and with proper corrective measures as indicated.

(5) Preoperative transfusion of all patients whose red blood cell count is below 3,500,000 per pubic millimeter, or whose hemoglobin is below 70 per cent. If for any reason the transfusion is not carried out before operation, blood in sufficient quantity should be available for use during the operative procedure.

(6) Correction of dehydration whenever it exists, since dehydrated subjects always present poor surgical risks. In elective cases operation can be deferred until the deficiency is corrected by oral hydration. In emergency cases parenteral therapy offers a rapid and effective method of correction.

(7) Determination of the optimum time for operation in patients with pelvic infection. The sedimentation rate is the most dependable criterion of the safe time, with 60 minutes the minimum. Clinically the most important criteria are freedom from tenderness and pain; a normal temperature of 7 to 14 days' duration; a white blood cell count with normal range; and absence of change in these criteria after pelvic examination or other activating circumstances. Operation should be deferred in patients who do not meet these requirements, and they should be treated by such measures as bed rest, diathermy and chemotherapy until they do.

(8) Correction of nutritional deficiencies. In elective cases such deficiencies can usually be corrected by dietary measures, with supplemental medication as indicated. In emergency cases the deficiencies, of which the protein deficit is the most important and the carbohydrate deficit the next most important, can be corrected by the intravenous administration of plasma, or, if anemia is also present, by the transfusion of whole blood, and by intravenous dextrose therapy. Vitamin deficiencies which must be corrected with special rapidity are best treated by the subcutaneous or, less well, by the intravenous injection of vitamin preparations.

(9) Prophylaxis against postoperative parotitis and respiratory complications by oral hygiene, with proper care of the teeth and gums.

Elderly Subjects.—Two groups of patients, the elderly and the obese, demand special mention, for they always present potentially or actually poor risks. There is nothing, of course, that can be done about age *per se*, and it is fortunate that gynecologic emergencies are not very usual in elderly women, and that time is usually available for proper study and preparation for operation.

A middle-aged or elderly woman should always be hospitalized for several days before elective surgery, and the measures outlined should be carried out with particular care in respect to examination and evaluation of the cardiovascular and renal systems and the liver, which are impaired by the mere continuation of life. Dehydration is frequent in such women, and anemia is also common. Both should be combated as necessary by parenteral fluid therapy if simpler measures are not promptly effective. Fluids, on the other hand, should be administered by vein in small quantities and slowly, and transfusions should seldom be given in amounts larger than 250 c. c. at a time, for the older the patient, the more readily do the tissues become waterlogged. Elderly patients should not be kept recumbent for long periods

of time, since hypostatic pneumonia develops insidiously and rapidly, and periods of bed rest should be judiciously interspersed with periods of activity.

Obese Subjects.—The obese woman is a surgical problem at any age, and an added problem if she is advanced in years, for she is peculiarly susceptible to acidosis, wound infection and fat necrosis, and pulmonary complications. A preoperative loss of weight is always desirable when elective surgery is to be performed, and it can usually be achieved by a properly selected diet, low in calories but containing adequate amounts of the essential food elements, particularly protein. If for any reason, including the necessity for emergency surgery, preoperative reduction of weight is not possible, all available measures to guard against complications should be employed.

ANESTHESIA

Not a great deal need be said about the choice of anesthesia, which is a matter to be determined in the individual case. A skilled anesthetist, familiar with the administration of all available agents and with all modern technics, is the first essential. The relative advantages of an inhalation anesthetic, preferably with a high oxygen content, of local infiltration and of spinal analgesia should be weighed in all poor risks. In aged subjects local or spinal analgesia is often the anesthesia of choice, or local infiltration can be combined with ethylene anesthesia. Cyclopropane is never used in women advanced in years, on the advice of our medical consultants, who regard it as dangerous in cardiac disease and in long operations.

Preoperative medication is routinely employed. It relieves apprehension, simplifies the induction stage of anesthesia, and provides for a period of comfort with gradual return to consciousness after operation. Oversedation should always be avoided, and is particularly undesirable in aged and obese subjects.

OPERATION

Not a great deal, again, need be said about the choice of the surgical procedure and its extent, since both are matters which must be determined in the special case under consideration. In general, the most conservative and least traumatic procedure possible should be chosen, and the amount of surgery should be predicated on the patient's physical status and her response to preoperative preparation. This evaluation is of particular importance in aged subjects, whose powers of endurance can easily be overestimated.

Attention to certain points of technic and similar matters during the surgical procedure will go far to reduce postoperative morbidity, and will prevent deaths in poor risk and sometimes in good risk cases. Special precautions include:

(1) Prevention of loss of blood beyond the irreducible minimum. In amputation of the cervix or trachelorrhaphy, blood loss can be prevented by the injection of 1 c. c. of obstetrical pituitrin into the cervix, and in anterior and posterior colporrhaphy and perineorrhaphy, the infiltration under the mucous membrane of the vagina of a solution of 5 minims of adrenalin to 1 ounce of physiologic salt solution likewise minimizes blood loss.

(2) Relaxation of tension on the abdominal muscles by attention to the position on the table. If the shoulders are slightly elevated, and if a pillow is placed under the knees to flex the thighs, easy closure of the abdominal incision is the rule.

(3) The use of incisions long enough to give full exposure, the length of the incision having nothing at all to do with the rate of healing after operation. This precaution is especially important in obese women, who are likely to have deep pelves as well as thick abdominal walls.

(4) Reduction of surgical trauma to an irreducible minimum. Complete relaxation of the tissues and the use of an incision long enough to facilitate exposure and prevent undue traction on the viscera and abdominal parietes have already been mentioned. Trauma is further avoided by using as little packing as is consistent with safety and by accurate placing of clamps, so that removal and re-application are not necessary. All manipulations are gentle, to minimize shock, reduce postoperative distention, and prevent the later formation of adhesions.

(5) Avoidance of undue prolongation of the

operative time. Gentleness in handling organs and tissues and care in peritonealization of raw surfaces are important, but such precautions should not be interpreted to mean that the operative time can be prolonged beyond a safe minimum. On the other hand, endeavors to shorten the operative time should not be interpreted to mean that any of the precautions listed can safely be omitted.

(6) The administration of fluids, including blood, by vein during the operative procedure. These measures are particularly important when extensive plastic work is performed by the vaginal route, or when there are special difficulties or risks inherent in an abdominal procedure. They should frequently be employed in poor risk subjects, including elderly women, even when the procedure would not ordinarily be regarded as dangerous *per se*.

POSTOPERATIVE CARE

Postoperative care begins in the operating room, where measures are taken to see that the patient is warm and dry before she is transferred to her bed. The anesthetist or a competent nurse should accompany her in transit, and she should not be left alone at all until she is completely reacted. This is a particularly important precaution when preoperative medication has been employed and reaction is delayed.

Routine and special postoperative care includes the following measures:

(1) The routine use of morphine or "pantopon" at four-hour intervals to control pain, prevent shock and stimulate intestinal tone.

(2) The routine use of prostigmin in 1 c. c. doses (1:4,000 solution) at four-hour intervals as a prophylaxis against abdominal distention and to reduce the necessity for catheterization.

(3) Precautions against the development of pulmonary complications. These are instituted immediately after operation when the attendant frequently changes the position of the patient until she is able to move herself about the bed. Deep breathing and coughing are practiced hourly as soon as reaction from the anesthetic has occurred. A back rest is permitted within four to six hours of operation in the usual case, and the patient is put into a wheel chair on the fourth or fifth day. We are aware of the excellent results achieved by surgeons who advocate ambulation the day of operation or shortly thereafter, but do not ourselves practice it.

(4) Attention to bladder function. The mere fact that a patient voids voluntarily does not necessarily mean that she has emptied her bladder completely. Catheterization, with the object of detecting possible residual urine, is therefore carried out as soon as the patient has voided for the first time after operation. If residual urine is present at this time, catheterization is carried out after each voiding until it disappears. A patient who is unable to void is catheterized at regular intervals until she voids voluntarily without residual urine Catheterization is undesirable, it is true, but overdistention of the bladder predisposes to urinary tract infection, as does the presence of residual urine, and also produces undue tension on the sutures in extensive vaginal plastic procedures. It is sometimes wise to use a retention catheter until voluntary urinary function returns.

(5) The prevention of abdominal distention, which is more readily guarded against by simple measures than corrected by elaborate ones. The immediate postoperative use of prostigmin has already been mentioned. Other prophylactic measures include the use of a heat tent over the abdomen, the restriction of fluids by mouth until normal peristalsis has been re-established and the use of the rectal tube. The patient receives nothing by mouth for a minimum of four hours after operation, then if nausea and vomiting are not present, tap water is permitted in amounts of 1-2 ounces at a time for the next six hours; cold drinks and iced water (including ice) are forbidden. If water is well tolerated, hot tea, coffee and gelatin dishes are allowed, but nothing else is permitted until 72 hours after operation. Soft diet is then permitted, followed by full diet as rapidly as the patient's condition warrants. The use of a rectal tube at regular intervals for the first four days after operation aids in the expulsion of gas from the colon and frequently forestalls the development of distention altogether.

(6) Continuous intestinal decompression, which is instituted promptly if vomiting is per-

sistent, or if distention occurs in spite of the measures just outlined. Decompression is continued until normal physiologic function is reestablished. It is also employed without delay, sometimes by means of the Miller-Abbott tube, on the first indication that intestinal obstruction, ileus or peritonitis may be developing. Oxygen therapy is a useful adjunct measure in such cases.

(7) The use of parenteral fluids according to the indications. A patient who cannot take fluids by mouth at all, or in the necessary quantities, is given glucose and Ringer's solution by vein, in the amount of 2 liters every 24 hours. A vitamin C preparation, in the amount of 500 mg. daily, is added to the solution daily for three days to promote rapid healing. Blood and plasma transfusions are used according to the indications.

(8) Precautions against the development of phlebitis and embolism. In addition to early movement, which also serves as a prophylactic measure against the development of pulmonary complications, special exercises for the extremities are begun at regular intervals early in the postoperative course.

(9) The application of heat to the perineum after vaginal operations and the instillation of a solution of aqueous mercurochrome, merthiolate or metaphen into the vagina helps to relieve soreness, lessen odor, prevent infection and promote healing. Dry heat is applied by means of an electric light bulb in a wire basket, the temperature of which is carefully controlled.

ANALYSIS OF CASES

In their essence these measures are much the same as those which I advocated before this session nine years ago. We have discarded such measures as the retention enema instilled on the operating table, as suggested by the late John G. Clark, because recent studies have shown it to be much less valuable than was formerly believed. We employ with greater frequency and with much more promptness such measures as infusions of dextrose solution, intestinal decompression and transfusions of whole blood and plasma. We are probably less complacent about surgical risk than we were nine years ago, and I know that we watch our patients after operation even more carefully now than we did then.

The results of the improved regimen are apparent in the improved results in our second series of cases (*Table 1*), which included 297 vaginal operations, 42 of which were hysterectomies and 60 of which were plastic procedures, and 203 abdominal operations, 112 of which were combined with vaginal plastic procedures and 130 of which were hysterectomies.

The greatest number of women in this series, 186, were between 30 and 40 years of age and the second largest group, 137, were between 40 and 50 years of age. On the other hand, 21 women were between 60 and 80 years of age, of whom three, all with complete prolapse of the uterus, were in the eighth decade of life.

Five of the 10 major postoperative complications in this series concerned the upper urinary tract. Two were postoperative hemorrhages (one followed a Sturmdorf amputation of the cervix and the other followed anterior colporrhaphy), one was an infection of the abdominal incision, one was a perineal abscess, and one took the form of parotitis. There was no instance in the series of intestinal obstruction, ileus, peritonitis, shock, cardiac failure, phlebitis, or pulmonary complications. Undoubtedly most of the complications which did occur might have been prevented by even more care than was

DISTRIBUTION OF PROCEDURES IN 500 CONSECUTIVE GYNECOLOGIC OPERATIONS

Vaginal operations	297
Dilatation and curettage, biopsy of cervix, conization of cervix, application of stem pessary	114
Plastic operations	60
Dilatation and curettage, application of radium	56
Hysterectomy	42
Amputation of cervix	23
Excision of Bartholin gland cysts	2
Abdominal operations	203
*Laparotomy and vaginal plastic	112
*Hysterectomy	130
Complete	68
Supravaginal	62
*Operations other than hysterectomy	56

*Some figures in these groups are overlapping.

Table 1

exercised, but the absence of potentially lethal complications such as occurred in the first series is gratifying evidence of what continued attention to details can accomplish.

The single death in the second series occurred in a woman 26 years of age, who died on the operating table under intravenous sodium pentothal anesthesia, which presumably was administered too rapidly. She was undergoing diagnostic curettage for metrorrhagia of undetermined origin, which examination of the uterine scrapings in the laboratory proved the condition to be due to hyperplastic endometritis.

Since this catastrophe we have used with caution sodium pentothal intravenous anesthesia, in spite of its convenience and generally good results in brief procedures. (Any anesthetic in which the margin between life and death is so narrow is in our opinion too dangerous for general use.) The fatality in this case was particularly regrettable because the patient had a nonlethal and readily correctable disease and was undergoing a minor, and definitely indicated, diagnostic procedure when it occurred.

SUMMARY

(1) Five hundred consecutive recent gynecologic operations in private practice have been analyzed from the standpoint of morbidity and case fatality and have been compared with a similar series of 1,000 cases reported in 1935.

(2) The second series shows a case fatality rate of 0.2 per cent, as compared with a gross fatality rate of 1.8 per cent and a corrected fatality rate of 0.9 per cent for the former series. It also shows a reduced incidence of major postoperative complications, though the criteria of selection were stricter in the second series than in the first.

(3) Preoperative and postoperative care was basically the same in both series. In the second series, however, full advantage was taken of recent therapeutic improvements, particularly the more liberal use of intravenous fluids and of whole blood and plasma transfusions, and the earlier and more frequent use of intestinal decompression. To these improvements, as well as to more careful and more constant observation to detect complications in their incipiency, can be attributed the improved results in this second series.

REFERENCE

1. Sanders, John T.; and Sellers, Thomas Benton: Some Important Factors That Influence Morbidity and Mortality in Gynecological Surgery. Based on a Review of 1,000 Consecutive Private Cases. South. M. J., 29:557-565 (June) 1936.

THE SIGNIFICANCE OF BLOOD VOLUME ALTERATIONS IN SURGICAL PATIENTS*

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The observations of Keith,[1] and Robertson and Bock[2] during the World War 1914-1918 that blood volume estimations could be made with considerable accuracy by use of dye methods served to show the importance of these technics in the study of traumatic shock. Unfortunately, for some years following the publication of their work, there was a waning of interest in the earlier dye methods for the estimation of blood volume in surgical patients; it was really not until the publication of Gregersen's newer method,[3] that serious efforts were again devoted to the study of blood volume in patients. The studies of Gibson and his coworkers[4] demonstrated the usefulness of the method, but many hospitals still have not added the technic to their laboratory procedures, simply because it is regarded as too laborious and time-consuming. The recent studies of three separate shock research groups (New York, Atlanta, Richmond) have all demonstrated the extreme importance of blood volume estimations; further use of the method in our laboratories has indicated that by using a simplified photo-colorimeter apparatus (Klett-Summerson colorimeter), one can determine blood

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*Most of the observations reported in this paper were made in the course of studies carried out under a contract, recommended by the Committee on Medical Research, between the office of Scientific Research and Development and the Medical College of Virginia, Richmond. This is paper No. IV in the series, "Studies on Traumatic Shock."

volume with not much more labor and time than is employed in many routine laboratory procedures.

It might be asked, why do not blood hemoglobin (or hematocrit) and plasma protein determinations suffice in estimating the state of the blood volume in the surgical patient? The answer may be direct and is exceedingly simple. In whole blood loss, almost equal quantities of red blood cells and plasma are missing, so that an hemoglobin and plasma protein concentration will be relatively unchanged, and the surgeon is given a false sense of security. In situations when moderate qualities of red blood cells and much plasma is lost, there will be evidence of hemoconcentration, yet there is no indication of red cell loss. Only in situations of relatively simple plasma loss (such as peritonitis and some burns) will hemoglobin and hematocrit determinations give an accurate picture of the trend of blood volume alterations.

The purpose of this communication is to illustrate the usefulness of the data obtained in blood volume estimations in the clinical study of surgical patients, and to indicate the significance of such data in the clinical management of several types of surgical patients; to point out that the benefits to be derived from a knowledge of blood volume data are not confined to those patients suffering from shock or burns.

For convenience of presentation, the discussion is divided into several categories, such as:

(1) Traumatic shock.

(2) Burns.

(3) Surgical trauma.

(4) Protein reserves in the patient.

(1) *Traumatic Shock.*—Prior to the present war, and largely as the direct result of the concept that shock is due to an increased generalized capillary permeability (Moon), it was believed and taught by many that what was lost from the blood stream in trauma was plasma, not whole blood. This was shortly attended by an increase in red blood cell concentration ("hemoconcentration") in the circulating blood. It was this teaching alone that caused clinicians and investigators alike to point out that what was demanded in the therapy of shock was plasma.

The investigation on blood volume changes in shock of the Bellevue group under Richards, Cournand and Gregersen[5] and our own group[6] has now clearly shown that there occurs quite regularly in skeletal trauma (to take what is at times the simplest type of clinical shock) a loss of circulating blood volume of approximately 40 per cent. If one calculates from hematocrit and plasma volume readings what is actually missing from the blood stream, it is soon found that whole blood, not plasma, is lost. Despite the earnest admonition of Moon[7] that such is not the case in traumatic shock, our findings have been amply borne out and supported by actual experience of qualified observers at the front.

We would not stress this so strongly were it not of extreme clinical, and not mere academic, interest. Further studies by our combined shock groups (Bellevue and Richmond) have indicated without any doubt that if to patients suffering from traumatic shock is administered only plasma, and no red cells, there will exist for days (and perhaps weeks) a serious deficit in circulating hemoglobin. We, therefore, cannot emphasize too strongly that although plasma infusions have played a remarkable role in the immediate resuscitation of the shocked wounded in this war, it is in no wise to be considered a substitute for whole blood.

Fig. 1 illustrates the loss of whole blood in traumatic shock.

(2) *Burns.*—Although we have become very aware of the extent of plasma loss in severe burns, many clinicians have been puzzled as to the cause of the serious anemia that develops after the second or third day in many burned patients. We believe blood volume studies may shed some light on this problem. We have[8] recently gone over the blood volume data of twenty severely burned patients, in whom plasma volume, hematocrit, and total circulating protein was determined as soon as the burn pressure dressings had been completed. These data demonstrate that although in many burn patients, the hematocrit readings may be quite high (53-68 per cent), indicating serious plasma

loss into the burn zone, that when total circulating red cell volumes are calculated, there is early a serious deficit in red blood cells. This amounted to a deficit of 490-1025 c. c. red blood cells in nine particular burn patients. These red cell deficits averaged 39 per cent of the total blood volume (plasma and red cell) deficit in these patients.

Therefore, these blood volume studies indicate that in the severely burned patients, there is a destruction (or loss) of red blood cells, so that whole blood transfusions are required early (24-36 hours) in the fluid therapy of burns.

(3) *Surgical Trauma.*—We shall not dwell at length on this problem, because it is readily apparent to any observant surgeon that what is lost during the course of a surgical procedure from the operative zone is whole blood (plasma and red cells). Therefore the only intelligent therapy to counteract this loss is the infusion of whole blood during and after the operation, not plasma alone.

The only real contribution blood volume studies have or can make in this particular problem is to show the extent of whole blood loss during major and prolonged surgical procedures. One can state that the blood volume studies we have made during these major surgical procedures simply indicate that:

(a) If shock supervenes during a surgical procedure in which there is attendant blood loss, the blood loss usually exceeds 30 per cent of the total blood volume.

(b) If only plasma is given to restore blood pressure, a serious secondary anemia is noted the following day.

(c) There is a grave tendency for the average surgeon to underestimate grossly whole blood loss during an extensive operation.

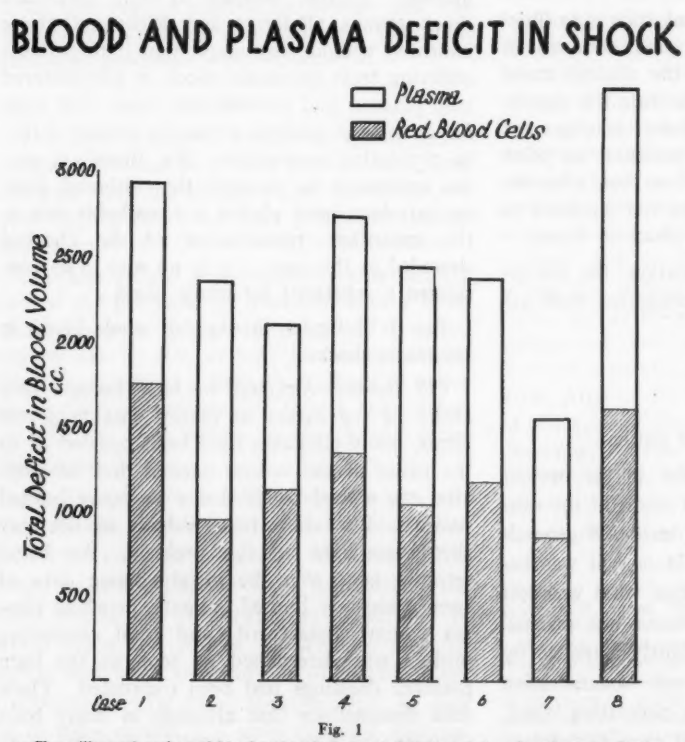

Fig. 1

Chart illustrating the red blood cell and plasma deficit in a series of patients in shock because of skeletal trauma. These blood volume data indicate that this type of shock is more likely to be due to loss of whole blood, rather than plasma alone.

(4) *Protein Reserves in Surgical Patients.* — The teachings of Elman, Ravdin and others have stressed the importance of adequate protein in the dietary preoperative management of surgical patients; it has become, therefore, almost a routine matter for well informed surgeons to ask for the determination of total plasma protein concentration as a preoperative measure before any extensive surgical procedure is contemplated. Nevertheless, we have often been chagrined to note that in some patients who had preoperative plasma levels of total protein of 6-7 per cent, that shortly after operation, edema was noted, and a subsequent blood examination showed that the total plasma protein concentration had fallen below the edema level (less than 5 per cent). We believe certain recently acquired blood volume data on

240 ward patients studied in our hospital may throw some light on this matter.[9]

These patients had been admitted either on the medical or surgical wards, and were all considered to be in a fair nutritive state. No patient with evident malnutrition was studied. While in the fasting, basal state, a blood volume, total plasma protein, albumin, globulin, and hemoglobin concentration was determined by suitable methods.

Despite the fact that only an occasional patient had a total protein concentration below 6.5 per cent, it was found that because of a low plasma volume, at least 50 per cent of the patients studied actually had a low total circulating plasma protein. This indicates to us that as tissue protein reserves are depleted because of a poor protein intake in the diet, the plasma volume is depressed to keep the oncotic pressure at a more satisfactory level (Whipple, Abbott, and others). Therefore, in many surgical patients, observations on the level of plasma protein concentration may be misleading and give false security as to the protein reserves of the patient.

These data on plasma volume may give the clue to the depressed protein concentration found often in the early postoperative period. Perhaps what happens, and it is believed the excellent work of Lyons[10] amply supports the impression, is that in the postoperative state, saline infusions are given in amounts large enough to cause an increase in circulating plasma volume, but protein reserves are so low that enough protein cannot be added to perform a concomitant increase in protein concentration, so this apparently falls.

Fig. 2 illustrates what is lost from the blood stream in the several groups of surgical patients mentioned in the text.

THE SIGNIFICANCE OF BLOOD VOLUME STUDIES IN SURGICAL PATIENTS

Additional evidence could be marshalled to indicate the importance of blood volume studies in surgical patients (that is, arteriovenous fistulae, effect of anesthetic agents, newer blood substitutes), but time and space does not allow for their full discussion. Enough factual material has been presented here for a discussion of the practical significance of these studies, as they concern the surgeon and his patient.

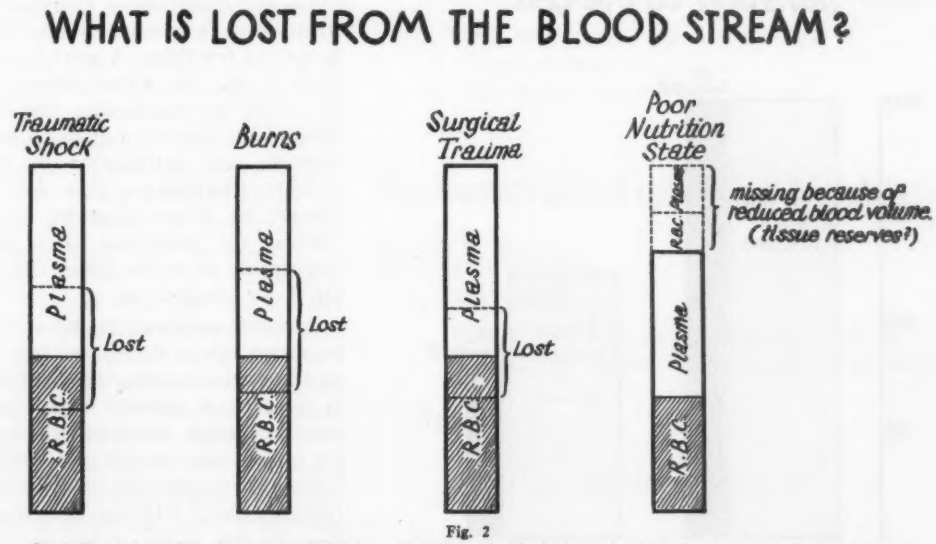

Fig. 2

Chart illustrating what components of blood are lost from the blood stream in shock due to trauma, burns, or operative surgery and what is lacking in surgical patients in poor nutritive state. The diagrams indicate the need for red blood cells as well as plasma, even in burns.

Skeletal and Surgical Trauma.—It is obvious from *Fig. 1,* made up of data on the calculated deficit of red blood cells and plasma in patients in shock as a result of fractures of femur or tibia, that there is a serious need for replacement of whole blood in large amounts (1,500-3,500 c. c.). In *Table 1* is presented a summary of the emergency management of such patients as concerns the restoration of blood volume. No deprecation of the use of plasma in the emergency treatment of shock is intended, but it becomes evident as more and more reports come in from the active battle zones that the agent of choice is whole blood. If an emergency operation is necessary, it is almost imperative that whole blood, not plasma, be given before and during operation. From *Fig. 2* can be seen the reason for this statement. In shock caused by acute blood loss, skeletal trauma, and operative trauma, there is a 30-40 per cent decrease in circulating blood volumes. Because whole blood is lost (and the cardiac output drops relatively more than we might infer from the actual decrease in blood), the actual oxygen transport (oxygen saturation xcardiac output) to the cells of the body is greatly diminished, often to only 40 per cent of the normal value. It may then be easily surmised that unless red blood cells (in large numbers) are provided, a serious cellular anoxia soon occurs, with irreparable damage to vital organs, such as brain, liver and kidneys.

Practically the same situation holds for blood volume changes as a result of surgical trauma. The urgency again is for whole blood in large amounts, unless a serious anemia is to be avoided in the early postoperative state.

Burns.—Our data on plasma and red blood cell deficits in severe burns indicate the pressing need for red blood cell infusions (as whole blood) early in the therapy of such patients. Only if this can be done will severe anemia be avoided. The amounts required are often large. Whole blood transfusions should be given early, often and in large amounts. A good general rule is to give whole blood transfusions (500-1,000 c. c.) as often as is necessary to maintain hemoglobin levels above 85 per cent (*Table 1*).

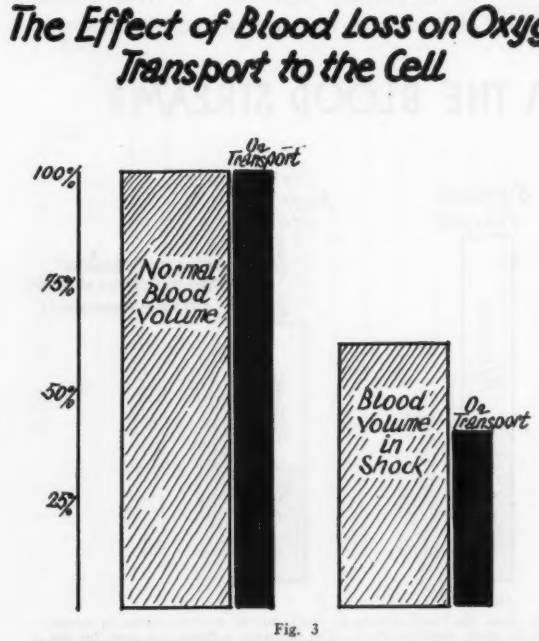

Fig. 3
Chart illustrating the effect on blood loss on oxygen transport to the cell. There will be a deficiency in oxygen transport as long as anemia exists. (After Dickinson Richards).

Surgical Nutrition.—Tremendous strides have been made in this field in the past few years. A great deal of credit is due Dr. Robert Elman of St. Louis for maintaining and developing the interest of surgeons, biochemists and nutritionists in the problem of surgical nutrition. Almost through his efforts alone has there resulted the production of a safe preparation of amino acids ("amigen") for parental use.

Adequate nutrition can play a most important role in the maintenance of an adequate circulating blood volume in the surgical patient. In the malnourished group, tissue and circulating protein reserves can be re-established at more optimum levels by the judicious use of 7-10 days to prepare properly this group of patients for operation. Large amounts of protein can be given by mouth, or if this is

not feasible, amino acid solutions ("amigen") can be given intravenously. If the data on the relation of total circulating plasma protein to plasma protein concentration discussed earlier mean anything, we would expect that by supplying adequate protein and mineral reserves to the surgical patient by proper preoperative management, there would result a more adequate circulating blood volume at the time of operation.

As Major Champ Lyons has pointed out,[11] "from a clinical point of view it must be assumed that every patient with a chronic infection is anemic," because of a reduction in blood volume. Reliance then should not be placed solely on hemoglobin and plasma protein concentration determinations. Instead, before every operation on a patient with a long-standing chronic illness (osteomyelitis, burns, colitis, and so on), the blood volume should be restored by adequate amounts of whole blood, (1,000-1,500 c. c. weekly). In general, in most patients there is little need for concern about overloading the vascular system with whole blood, so it may be given as long as the hemoglobin levels remain below 85 per cent.

Time is not available for a discussion of the mineral requirements of surgical patients and their relation to blood volume. Mention should be made of the extreme need for sodium chloride in one particular group, patients with intestinal obstruction, especially if vomiting has occurred. In *Fig. 4* is shown the lack of response of a patient with intestinal obstruction until salt was given. Infusions of 10 per cent glucose in water affected the patients' clinical state very little, but shock was readily abolished with the infusion of 35 grams of salt. This effect on restoration of circulating plasma volume by salt infusions has been extensively studied by Lyons.[10] What then should be the goal of the surgeon in these matters? (*Fig. 5*). It seems to us that every attempt should be made to maintain or establish adequate blood volume in all surgical patients by:

(1) Restoration of blood or plasma lost from the system.

(2) Maintenance of adequate blood volume by adequate nutrition in the pre and postoperative state.

(3) Maintenance of a normal concentration of red blood cells.

If this can be done wound healing and con-

The Restoration of Blood Volume

Skeletal Trauma

1.) Emergency - Plasma (1000 - 2000cc)

2.) Whole Blood - 2000 cc., especially if operation is considered

Burns

1.) Plasma (1000 - 2000cc)

2.) Whole Blood (1 pint blood for each 2 pints plasma)

3.) Keep Hemoglobin above 85% by
a.) Frequent Blood Transfusions
b.) High Protein Diet or Amigen (Elman)

Table 1

The Restoration of Blood Volume

Surgical Trauma

1.) Preoperative
Spend 7-10 days getting patient in good nutritive state (Diet, Amigen, Whole Blood Transfusions)

2.) Operative
Hemostasis!
Blood Transfusions (1000 - 3000cc)

3.) Postoperative
Blood Transfusions, Amigen, High Protein Diet

Table 2

valescence will be expedited, and surgical patients will be restored to active, normal lives much sooner than if the blood volume is allowed to remain at low levels. The incidence of operative shock and infection will decrease because body mechanisms will be more able to cope with the added load imposed by operation.

Too much attention cannot be devoted to efforts to maintain a high protein intake by mouth, if this is possible. It is our impression that although tissue protein when readily available is useful as a source of the necessary amino acids for cellular repair, their supply is necessarily limited and is soon exhausted. A normal circulating blood volume is needed to insure a large, open capillary bed in the zone of injury (traumatic or surgical) so that foodstuff can be dispersed there in adequate quantities. The proper concentration of red blood cells is indispensable so that oxygen and amino acid transported to the cells is at an optimum level. It is emphasized here that the surgeon should be cognizant of the fact that if any anemia exists, the total circulating red cell volume is depressed; this can only be corrected by red blood cell infusions (as whole blood).

Only when the blood volume is maintained will tissue repair proceed with regularity, so

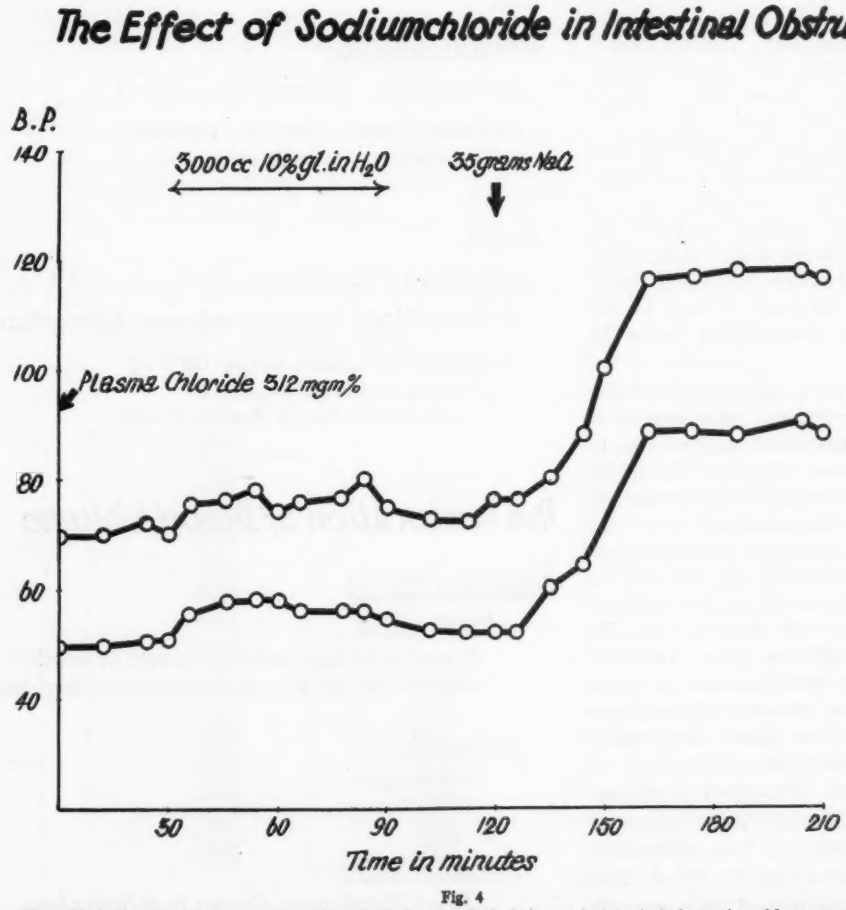

Fig. 4

Chart illustrating the requirements for salt in shock due to salt depletion, as in intestinal obstruction with severe vomiting.

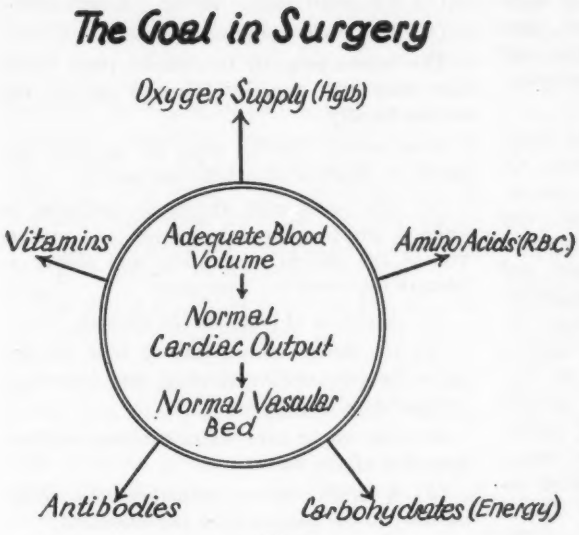

Fig. 5
An adequate blood volume, with attention to constituents (red blood cells) must be maintained if cellular repair is to proceed rapidly.

that the final goal of all surgery is achieved easily, that of perfect wound healing.

SUMMARY

A discussion of the value of blood volume determinations in the study of several groups of surgical patients has been presented. The inference has been made that the circulating blood volume is constantly being altered by many factors, such as acute blood loss, skeletal trauma, burns, surgical procedures, and the nutritive state of the patient. The deduction has been made that when these blood volume changes are measured and known, they yield information valuable in the therapy of the patient; and the conclusion is reached that only when circulating blood volume is maintained at a normal level, both as concerns total volume and concentration of important constituents, can cellular mechanisms and repair proceed with expedition.

BIBLIOGRAPHY

1. Keith, N. M.: Medical Research Committee Reports, IX, London, 1919.
2. Robertson, O. H.; and Bock, A. V.: Medical Research Committee Reports, VI, London, 1918.
3. Gregersen, M. I.: J. Lab. & Clin. Med., **23**:423, 1938.
4. Gibson, J. G. II; and Evelyn K.: J. Clin. Invest., **17**:153, 1938.
5. Richards, D. W. Jr.: Bull. of N. Y. Acad. of Med., **20**:363, 1944.
6. Evans, E. I.; Hoover, M. J.; James, Watson III; and Alm, T. E.: Ann. of Surg., **119**:64, 1944.
7. Moon, V. H.: Internat. Abs. of Surg., **79**:1, 1944.
8. Evans, E. I.: Unpublished data.
9. Evans, E. I. and Forbes, J. C.: Unpublished data.
10. Lyons, R. H., Jacobsen, S. D., and Avery, D. L.: Amer. Jour. Med. Sci., **208**:148, 1944.
11. Lyons, Champ: J.A.M.A., **123**:1007, 1943.

DISCUSSION (*Abstract*)

Dr. Howard A. Farren, Manchester, Tenn.—During operation upon a patient who has lost 1,000 c. c. of blood, what amount would that patient have lost if he had been given 5 per cent glucose and saline while the operation was going on?

Dr. Evans (closing).—That is an intelligent approach because it leads to a question that is easy to answer. Simply this and this is the point of the whole matter: if you lose, say, 1,000 c. c. of blood you have lost about 450 c. c. of red cells, and if you do not replace those 450 c. c. of red cells by intravenous whole blood you end up the next day with a depressed circulating red cell volume. You cannot replace whole blood or red cell loss with anything but red cells.

THE RELATIONSHIP BETWEEN ANESTHETIST AND SURGEON*

By RUSSELL F. BONHAM, M.D.
Houston, Texas

This is rather an important and broad subject with many angles, some of which I will try briefly to describe.

An old Chinese proverb says, "A journey of a thousand miles begins with the first step." Many of the first steps of the journey of the anesthetists and surgeons have been taken.

A century ago, the advent of ether anesthesia catapulted surgery into a maze of problems and achievements. Although major progress in surgery depends upon progress in anesthesia as well, the latter science has not always shared the attention of its colleague. Anesthesia offers surgery a contribution which will enable the two sciences to go forward to greater accomplish-

*Chairman's Address, Section on Anesthesia, Southern Medical Association, Thirty-Eighth Annual Meeting, St. Louis, Missouri, November 13-16, 1944.

ments and achievements. The fields of anesthesia and surgery are much dependent upon each other and by mutual understanding and cooperation of the surgeon and anesthetist, greater accomplishments are attained.

The surgeon and anesthetist should know each other's qualifications and capabilities. Of course sometimes if the surgeon knew his anesthetist, he would not have him, and vice versa. Anesthesia has been greatly improved and advanced during the past few years, and of course so have anesthetists. The anesthetists are indebted to the surgeons, of course, for their cooperation in this advance. For until a few years ago the anesthetics were little considered. The least experienced of the surgical team, such as a nurse, medical student, intern, general practitioner, or layman, none of whom may have ever given an anesthetic, were selected by the surgeon to drop ether or chloroform, haphazardly, on the open mask of the patient. This status of conditions, however, is fast fading, due to the better development of each specialty, and of cooperation and recognition between the surgeon and anesthetist.

With this better cooperation of the surgeons, the present accomplishments in anesthesia have been developed by an active group of ambitious medical anesthetists, who have proven themselves to be tireless seekers of improvement. They wanted more than merely to obtain abolition of pain and a suitable operative field, but also to maintain, for the patient, the most nearly normal physiology and metabolism, during the surgical procedure, and also to afford the patient the least discomfort, before and after operation.

When a patient comes to the operating table, it is the duty of the anesthetist and surgeon to see to it that he has first consideration, or priority, as to safety for the anesthesia and surgical procedure.

The surgeon and anesthetist should consult each other on the following items:

(1) Preoperative estimation of anesthetic and surgical risk, and the necessary measures should be taken accordingly, to give the patient the best chance.

(2) The surgical procedure to be undertaken.

(3) The anesthetic of choice, for each case.

(4) The preliminary medication.

The failure properly to consider these conditions may rush a patient through surgery and end in fatality.

Now to state briefly, what the surgeon may expect of modern anesthetic knowledge:

(1) The anesthetist should be prepared to make a preoperative examination and evaluation of the patient's condition, and ability to tolerate the operative procedure.

(2) Abolition of pain, for the patient.

(3) He should know, and be able to prescribe the preoperative surgical, and immediate postoperative medication.

(4) He should gain the confidence and cooperation of the patient.

(5) A rapid, pleasant induction, and similar recovery of the patient from the anesthetic.

(6) The anesthetist should, at all times, have a comprehensive knowledge of the patient's condition, and should be in position to warn the surgeon of impending danger. He should be able to take necessary means to treat shock, respiratory arrest, and other emergencies in general, during operation, and immediately postoperatively.

(7) The surgeon desires to operate in a room as free as possible from obnoxious gases.

(8) The surgeon desires relaxation for abdominal surgery, the proper intrathoracic pressure in chest surgery, and likewise a suitable operative field in any operation.

(9) The anesthetist should be familiar with all anesthetic agents and technics, and know how to use them. He should be competent to discuss with the surgeon all the measures and the condition of the patient, and together they should decide upon the anesthetic of choice, for every case.

I might add that tact and personality are a great boon to the anesthetist, as well as the surgeon, not only for the patient's sake, but for each other. They promote further calls or business. The anesthetist and surgeon, working together in a good fellowship, can render better service to the patient.

To qualify as an expert anesthetist, the standards are much higher now than a few years ago. At the present time, the qualified anesthetist needs not only his regular course in medicine for his M.D., but special training in anesthesia thereafter. Many schools have seen the necessity of advancing anesthesia, and are devoting more time in the curriculum to its teaching: also some hospitals are now giving from one to three years residency in anesthesia, just as in surgery or any other specialty.

The science and art of anesthesia has not only advanced in recent years, but many new methods and drugs likewise have come into accepted use. We now have not only inhalation anesthesia, but also spinal, caudal, block, intravenous, rectal and various combinations of these. Also since the advent of ether, chloroform, and nitrous oxide, various other anesthetic drugs have come into accepted and common use.

Of the gases there are nitrous-oxide oxygen; ethylene oxygen; cyclopropane oxygen; and some other less desirable, such as "somnoform" and ethyl chloride. Helium is a recent addition to the field of anesthesia, as well as in helium-oxygen therapy. It is not an anesthetic, but a diluent, and a valuable adjunct, in both anesthesia and in the treatment of allergy, or pulmonary conditions. Other anesthetic agents are the various procaine, "pontocaine" and allied drugs used for spinal, topical, or regional block. Then the intravenous drugs, such as "evipal," "pentothal" sodium and "intercostrin." Also the barbiturates and "avertin" have their place in the realm of anesthesia. With all the newer anesthetic drugs and technics, and skilled anesthetists, the surgeons have gone far in thoracic, cardiac, and various other surgical procedures.

One of the great obstacles now prevailing over the country, is the shortage in skilled medical anesthetists. The specialty of anesthesiology, being a virgin field, is not overcrowded with aspirants, at least not nearly so much as some of the other specialties. The reason for this, however, I believe, is largely an economic one, as is well known. Many young doctors have felt a little reluctant to take up anesthesiology as a specialty, probably for two reasons, first, and foremost, being that the income was inadequate, and the other, that they do not realize the importance of anesthesia, and the vast progress that has been made in this field.

As to the economic situation, many localities, and groups, have so organized that the income of the anesthetist is comparable to that of the average physician of other specialties, which is as it should be.

The other reasons for enticing young physicians into the specialty are only a matter of education. But these difficulties are being worked out and will be further worked out between the surgeon, anesthetist, and hospitals, as each work mutually together, financially, as well as scientifically.

The war has also shown the need for skilled anesthetists, and in turn the War Department recognized and established anesthesia as a specialty with the armed forces.

So the economic relations of the anesthetist to the surgeon, the patient and hospitals, should concern us to a greater extent than has been true in the past. With the establishment of the American Society of Anesthetists, the International Anesthesia Research Society, and the American Board of Anesthesiology, as recognized by the American Medical Association, surgeons, internists, anesthetists and other specialists will encourage more young physicians to enter our specialty. Anesthesiology has given the surgeon and the people of this country a sense of the obligation of every anesthesiologist: obligation to the patient, whom he serves; to the profession of which it is a privilege to be a member; and to the community and the country in which he lives.

As the service of anesthesiology and training of the specialty goes on, and the economic problems are better worked out to entice more young physicians to enter the specialty, the supply of skilled anesthetists will become more plentiful.

Surgeons, anesthetists and hospitals, and in many localities, the lay public, have seen the light in desire for better surgery, better anesthesia, and better service to mankind. Many times now the patient, or layman, demands his

particular anesthetist, just as he demands his surgeon or internist.

So we who have seen the light must give the signal to others, and by mutual cooperation and assistance the anesthetists and surgeons will push on to greater fields of progress and achievement, for the betterment of mankind.

DISCUSSION (*Abstract*)

Dr. Fred E. Woodson, Tulsa, Okla.—The men in Texas have done much in the field of anesthesiology to promote a fine relation between anesthesia and surgery. The surgeon and the anesthetist are a team. The anesthetist runs the interference. He is the consultant, the helper. He is the man who makes hard surgery easy.

There are many large cities in the South where there are only one or two physician-anesthetists, and many of you know those cities where anesthesia departments are still run by the hospitals. The large bulk of the anesthesias are given by nurses who have had some training and by some who have had very little training.

When the war is over and a number of our men return, we will have an opportunity to enter some of these big cities in the field of anesthesiology. Physicians in the small communities who are doing general practice are now becoming interested in anesthesia as an adjunct to their practice. That is a good thing for small communities, because the surgeons with whom they work are getting better service, because these men are attending meetings, they are reading scientific papers and they are able to give to their surgeons a better type of anesthetic than in the old way when the general practitioner referred his surgery to his favorite surgeon and then came in and gave the anesthetic. That was not very good surgical teamwork.

Dr. R. L. Sanders, Memphis, Tenn.—The surgeon feels his dependence upon the anesthetist and can operate to best advantage only when he is confident that the person at the head of the table is capable of handling the anesthesia properly. Being relieved of that part of the responsibility, his mind is free to concentrate on his own work.

The difficulty is, there are not enough physician-anesthetists to go around. As I have stated before, in 1942, 12,500,000 patients entered the hospitals of this country and an operation was performed on an average of every 5½ seconds. Last year, these numbers were even higher, and this year and every year for some time they will probably continue to increase. In my own city, which has a population of nearly 400,000 people, we have not, and, so far as I know, have never had a physician-anesthetist. This situation is, no doubt, duplicated in a number of cities. The field is wide, therefore, and the need is urgent and becoming constantly more so. We surgeons are ready to give you every encouragement in your efforts to develop your specialty and increase your ranks, realizing that you and we, and our patients most of all, will benefit when there are an ample number of physician-anesthetists to meet the requirements of every hospital in the country.

Dr. E. G. Martin, Detroit, Mich.—In Detroit we are suffering as they are in Memphis at many of our hospitals. If one has a competent anesthetist he proceeds with his surgery without a concern which is otherwise present. If a surgical procedure takes more than an hour, the continuous spinal has been most helpful when expertly managed.

I recently performed an abdomino-perineal resection with cyclopropane complemented with curare. This combination was completely satisfactory, and I shall be interested to learn more about curare with anesthesia. One of our medical men has found a place for its use in the treatment of some conditions with chronic muscle spasms.

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EDITORIAL DEPARTMENT

SOME OF THE PENICILLIN RESISTANT DISEASES

The great field of penicillin is against the streptococci, pneumococci, staphylococci, gonococci, meningococci, and probably syphilis. It is still being extensively tried for most of the other infectious conditions for which there is no specific therapy. Among the unconquered plagues of medicine today are the virus diseases, tuberculosis, and subacute bacterial endocarditis. They have in common merely the fact that they are microbic diseases which have shown little response to the chemotherapy of the last five years. Instances in which they have apparently yielded to these products in the laboratory keep hope alive that some drug similar to the sulfa preparations or the mold filtrates will eventually control them. It is hoped that by study of drugs now in common use will come substances which will sterilize the blood of the minute filterable viruses, the larger, mold-like mycobacteria, and the intermediate streptococci which have not yet yielded to therapy. Many bacteriologists are working to discover medication for the remaining resistant diseases.

Parker and Diefendorf,[1] of Western Reserve University, have made detailed studies of the effects of penicillin upon half a dozen different viruses. Several vaccinia viruses, two strains of encephalitis, psittacosis, and a meningo-pneumonitis were included. The organisms were cultivated both in test tubes and on the living chick embryo, and penicillin was administered both before inoculation and simultaneously with it. Against most of the viruses it was entirely ineffective. However, it favorably influenced the course of psittacosis and meningo-pneumonitis, in which diseases it delayed or prevented death and sterilized the medium. The quantities employed were so large that the investigators believe the method to be impractical for clinical use. Comparable amounts in humans would require injection of several million units daily.

Schatz and Waksman,[2] of the New Jersey Experiment Station in New Brunswick, note that penicillin has no effect upon tuberculosis. However, other mold products at times inhibit its growth. Among these is streptomycin, obtained from a variety of actinomyces. Certain sulfa drugs have also been reported to inhibit it, and have possibly more promise.

Subacute bacterial endocarditis is another disease against which modern chemotherapeutic methods have had little success. Boston workers have recently reviewed and analyzed reports of its treatment over a period of years.[3 4 5] Before 1939, vaccines and sera were extensively employed, and no method of therapy was beneficial. The introduction of the sulfonamides and penicillin so widened the field of antisepsis as to arouse new hope for this syndrome, and since 1939, some cures have been reported. The effects of the sulfa drugs, however, are usually merely a transient lowering of the temperature and temporarily negative blood culture. Sulfapyridine had a greater antipyretic effect than the other sulfonamides. The addition of heparin to the therapy, with the object of preventing coagulation of the blood and further deposition of

1. Parker, R. F.; and Diefendorf, H. W.: Effect of Penicillin on Certain Viruses. Proc. Soc. Exper. Biol. and Med., **57**:351 (Dec.) 1944.

2. Schatz, Albert; and Waksman, S. A.: Effect of Streptomycin and Other Antibiotic Substances Upon Mycobacterium Tuberculosis and Related Organisms. Proc. Soc. Exper. Biol. and Med., **57**:244 (Nov.) 1944.

3. Kelson, S. R.; and White, Paul D.: Notes on 250 Cases of Subacute Bacterial (Streptococcal) Endocarditis Studied and Treated between 1927 and 1939. Ann. Int. Med., **22**:40 (Jan.) 1945.

4. Kelson, Saul R.: Observations on the Treatment of Subacute Bacterial (Streptococcal) Endocarditis since 1939. Ibid., p. 75.

5. White, Paul D.; Mathews, M. W.; and Evans, Elwyn: Notes on the Treatment of Subacute Bacterial Endocarditis Encountered in 88 Cases at the Massachusetts General Hospital During the Six Year Period 1939 to 1944 (Inclusive). Ibid., p. 61.

platelets and fibrin on the bacterial vegetations, was thought to be of some benefit.[4]

Whether penicillin with heparin is better than sulfapyridine, the Massachusetts' workers[5] consider still unproven. A few cases appear to have been controlled with sulfapyridine and heparin. Of nine cases treated with penicillin alone, six showed definite control, perhaps cure, after massive doses. Complications such as cerebral embolism, acute rheumatic infection, and congestive heart failure, followed in some of the cases presumed to be controlled. Upon careful examination of case reports of cures of subacute bacterial endocarditis, they say that more instances of improvement probably followed in cases of endarteritis of the patent ductus arteriosus treated by surgical closure, than merely following chemotherapy.

It would seem that more than merely the microorganism is etiologic in subacute bacterial endocarditis. There is a physiologic defect, which may show in other ways than merely as bacteremia. Control of the infection and fever, if further studies increase the percentage of these, should be a long step forward.

SEX REVERSAL

Among the recently studied effects of the gonadal hormones is their ability to reverse sex among low forms of life. Humphries,[1] of the University of Buffalo, fifteen years ago, completely altered female salamanders to male by early treatment with implants of testicle. He has recently made studies of the progeny of the made males. They developed normally and reproduced and the offspring in turn were normal. About a fourth of them were males, the rest females.

Experimentation with a higher animal, the opossum, shows effects to some extent similar. By appropriate treatment of the female opossum with androgens, the formation of a prostate gland histologically indistinguishable from that of the males may be induced. Its anatomy and structure have been extensively studied and reported on by Carl Moore,[2] of the University of Chicago.

At birth, the young opossum is very small and its sex is undifferentiated. It remains in the marsupial pouch for about eighty days, during most of the time firmly attached to the nipples. In male animals, the beginning of the prostate gland may be detected microscopically by the sixteenth day after birth. Females given androgens by ointment painted over the skin or by injection earlier than the sixteenth day likewise developed prostate glands. The earlier the treatment began the greater was the development. A weak response was obtained at older ages and none at all if hormone treatments were delayed a month after birth.

The prostate once stimulated, continued to grow in the female animals after androgen therapy was stopped. A two weeks old female treated since three days after birth, showed prostatic development like an older male. There were no failures if the treatments were started early enough. Young male animals which received the hormone showed an increase in the rate of development beyond that of the females.

It would seem possible that androgen treatment of pregnant females could alter the sex ratio of the young. At least this would be worthy of investigation. Studies of the androgen-estrogen ratio should eventually throw light upon the origin of hermaphroditism and other anomalies of the urogenital system; and eventually of the etiology of one of the commonest diseases of old age, the enlarged and obstructing prostate.

Since the anatomical changes once set in motion in the laboratory animals continued of their own momentum, without further therapy, physicians should be slow in administering androgens or estrogens to the young. Changes induced during growth may not recede so quickly or completely as has been believed.

1. Humphrey, R. R.: Sex Determination in Salamanders. A Study of the Progeny of Females Experimentally Converted Into Males. Amer. J. Anat., **76**:33 (Jan.) 1945.

2. Moore, Carl R.: Prostate Gland Induction in Female Opossum by Hormones and Capacity of the Gland for Development. Amer. J. Anat., **76**:1 (Jan.) 1945.

REMOTE EFFECTS OF TRAUMA

Many examples of effects upon distant tissues of head injury have been noted. Tedeschi[1] of Harding, Massachusetts, comments upon the long recognized fact that cerebral birth injuries are often related to erosions in the mucosa of the alimentary tract. In 1932, Cushing reported development of intestinal ulcers after brain surgery. Tedeschi describes hemorrhagic changes, sometimes erosions of the gastric mucosa of the rat following repeated head injury not powerful enough to cause unconsciousness, hemorrhage, or other visible evidence of damage at the site of the blow. In these animals, although no gross injury was detected, at autopsy cumulative injury to the neurons of the head was noted. The gastric lesions may be interpreted as the result of shock.

Mirsky and Freis[2] from the Army air hospital in Lincoln, Nebraska, have studied some other of the remote effects of shock or trauma, and they note that similar remote effects upon organs of the body may follow parenteral injection of certain enzymes. Shock, they say is sometimes explained as due to liberation of a toxin. Following extensive tissue damage a protein destroying enzyme may be released into the blood stream which can cause lysis of protein in remote parts of the body. It could at the same time be responsible for the negative nitrogen balance known to exist in practically all types of shock. They studied liver and kidney damage in rabbits and rats which received injections of a crude trypsin preparation, 4 per cent in saline. Shock-like symptoms appeared in the animals, and at autopsy abnormalities of the kidney, liver and spleen were detected. The findings supported the hypothesis that a substance like trypsin released from injured tissues could have effects similar to those of trauma, and might be responsible for the syndrome of shock.

It is obvious that many different substances must be taken up by the blood stream after a break in the capillaries. Many of them are adequately disposed of by the body defenses, or pinpricks would be major injuries. As the quantity of products of local tissue damage increases, they doubtless become highly destructive and dangerous. Remote injuries in the alimentary tract or other vital organs caused by external trauma will perhaps be common among the battle injured, and should be taken into account diagnostically.

1. Tedeschi, C. G.: Cumulative Effects of Repeated Head Trauma of Minimal Intensity. Observations on Experimental Animals. Proc. Soc. Exper. Biol. and Med., **57**:264 (Nov.) 1944. Gastric Mucosal Lesions in Rats Submitted to Head Trauma. Ibid., p. 268.

2. Mirsky, I. Arthur; and Freis, E. D.: Renal and Hepatic Injury in Trypsin "Shock." Proc. Soc. Exper. Biol. and Med., **57**:278 (Nov.) 1944.

TWENTY-FIVE YEARS AGO

From Journals of 1920

Transportation, American Medical Meeting, 1920.[1]— As previously announced Dr. Ira J. Haynes, P.O. Box 24, Richmond, Virginia, is arranging for a party to go by boat from Richmond to New Orleans. He desires to correspond with physicians who would like to join such a party. The tentative plans for the trip provide that the boat shall leave Baltimore Friday, April 23, and arrive in New Orleans April 27. It is proposed that those who desire to do so may use their state rooms during the stay in New Orleans and obtain breakfast on board the boat.

New Orleans Meeting, Accommodations.[2] — Dr. H. W. E. Walther, Chairman of the Committee on Transportation, . . . offers a suggestion that would make the physicians who go to New Orleans more comfortable, and at the same time insure more space for the men who are visiting New Orleans and the South for the first time: . . . in the February 14th number of the *Journal of the A.M.A.* . . . there appears a note to the effect that physicians attending the New Orleans meeting of the A.M.A. might charter Pullman coaches and occupy them while at the convention instead of going to hotels. . . . "Due to the fact that all of our hotels are going to be taxed to their capacity, we would like to appeal to all of our Southern medical men to adopt the 'chartered pullman coaches' idea wherever practical, thereby giving more room in the hotels to our guests from the North, East and West."

War Ration of Denmark.[3]—In a recent issue of the *Journal,* Hindhede of Copenhagen, discussed the effects of food restrictions. . . . on the Danish people as a result of the blockade existing during the latter years of the war. . . . Essentially the plan of the Danes consisted in reserving the available cereals . . . for the people instead of feeding them to domestic animals . . . the number of swine in Denmark was soon reduced to one-fifth of the prewar stock . . . this necessitated a lowering of the protein content of the dietary . . . and a large

1. Association News. J.A.M.A., **74**:680 (May 6) 1920.

2. Editorial: The New Orleans Meeting of the A.M.A. Sou. Med. J., **13**:224 (March) 1920.

3. Editorial: Is Fat Indispensable for Well Being? J.A.M.A., **74**:736 (Mar. 13) 1920.

deficit in the fat content . . . the cereals were milled only slightly, so as to retain a number of the outer nitrogenous layers . . . Bran . . . was considered to be a very valuable food . . . While fat was regarded as a very valuable addition to the dietary, it was not considered . . . necessary . . . Vitamin A . . . is present in considerable abundance in many vegetables . . . whether fat as such . . . is indispensable in nutrition . . . is still an unanswered question.

Book Reviews

Operations of General Surgery. By Thomas G. Orr, M.D., Professor of Surgery, University of Kansas School of Medicine, Kansas City, Kansas. 723 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1944. Cloth $10.00.

This is the newest textbook on operative surgery and will rank among the best. The first three chapters are on general principles embracing "Wound Healing;" "Treatment of Fresh Wounds;" "Sutures and Knots." Following these are eighteen chapters arranged in systems rather than in strictly anatomical divisions, to emphasize, as the author points out, the general surgical features of the book.

Accuracy and clarity of illustrations have been stressed rather than too long discussions of operative procedures. However, the text in every instance, gives adequate step-by-step description of the operation under consideration.

Sections on abdominal operations are usually comprehensive and are splendidly illustrated. The same may be said of other sections. Chapters on the nervous system deal extensively with peripheral nerves, skull fractures, injuries of the spine, and operations on the sympathetic nervous system. Brain tumors and operations on intervertebral disks are omitted.

The volume is beautifully bound, abundantly illustrated, and the print is excellent. These make for easy reading and ready understanding.

Surgery of the Hand. By Sterling Bunnell, M.D. Licentiate of American Board of General Surgery and Plastic Surgery. 734 pages, illustrated. Philadelphia: J. B. Lippincott Company, 1944. Cloth $12.00.

The scope of Dr. Sterling Bunnell's new book is truly amazing. The presentation of the subject, the illustrations, the innovations in technic, and the mechanics are those of a master engineering surgeon. The book is a distinguished accomplishment by a distinguished doctor.

The text is divided into four parts. Part one is limited to a discussion of comparative anatomy and of the normal hand. This covers 55 pages and is most thorough. Part two is a superb discourse on reconstruction of the hand disabled by injury or disease. Included in this part is a discussion on the relation of the arm to the hand. Part three is made up of 160 pages dealing with injuries and infections of the hand together with a discussion of the hand in industry. Part four deals with other conditions found in the hand and includes congenital deformities, vasomotor and trophic conditions, and tumors of the hand. The text of 717 pages is as interesting and as hard to leave as a good novel. In it are to be found new methods and lines of treatment that cannot be found in any other text.

Dr. Bunnell's book impresses one with the magnitude of the subject and should go far in changing the idea that hand surgery is minor surgery. The surgeon doing reconstructive hand surgery must combine plastic, orthopedic, and neurologic surgery. The practice of allowing inexperienced interns, working without supervision, to attempt the primary repair of a severely injured hand can not be too strongly condemned.

Symptoms of Visceral Disease. A Study of the Vegetative Nervous System in Its Relationship to Clinical Medicine. By Francis Marion Pottenger, A.M., M.D., LL.D., F.A.C.P., Medical Director, Pottenger Sanatorium and Clinic for Diseases of the Chest, Monrovia, California. Sixth Edition. 442 pages, illustrated. St. Louis: The C. V. Mosby Company, 1944. Cloth $5.00.

The author practiced as a specialist in pulmonary diseases for twenty years, then he became convinced that medicine is a unit and not divisible into specialties.

This book attempts to bring an important phase of physiology to physicians. It is preeminently a discussion of man as a segmented organism. On the one hand, it describes visceral and somatic relationships to neurons which take origin in the various segments of the cord; and, on the other hand, it describes the reflexes which result from this association. It is a study of symptoms, the interpretation of which is the basis of clinical medicine. The vegetative nervous system, when its normal action is disturbed, furnishes one of the chief paths through which symptoms of visceral disease are expressed, the common bridge between activator and end-results. The correlation of body activities cannot occur except through nerves and chemical substances, such as the products of the glands of internal secretion.

The author's first monograph appeared in 1919, twenty-five years ago. This volume is the sixth edition which brings up to date his work and that of others in the same field. He gives full references at the end of each section. The study is made plainer and easier with 87 text illustrations and 10 colored plates. He divides his work into three parts: (1) the vegetative nervous system; (2) the relationship between the vegetative nervous system and the symptoms of visceral disease; and (3) innervation of important viscera with a clinical study of the more important viscerogenic reflexes.

This volume is an important contribution to a subject that has long been considered as largely theoretical and mystical.

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and **VICTORIA CRANFORD**, Psychotherapist and Rorschach Analyst, Haarlem Lodge, Catonsville, Md.; The Farm for Alcoholic Patients, Howard County, Md.

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Southern Medical News

ALABAMA

Dr. James S. McLester, Birmingham, Chairman of the Council on Foods and Nutrition of the National Research Council, has accepted appointment on the special medical advisory board of the Veterans Administration. He is the fifteenth medical man to join the advisory board and his acceptance completes the group.

Dr. George A. Shipman, Director, Division of Industrial Hygiene, Birmingham, has been succeeded by Dr. Irving R. Tabershaw, Surgeon, U. S. Public Health Service Reserve, formerly assigned to the Division of Occupational Hygiene, Massachusetts Department of Labor and Industries, Boston, Massachusetts.

Dr. Roddie L. Stewart, Lieutenant, Medical Corps, A.U.S., Pell City, was recently awarded the Bronze Star for meritorious service as headquarters battalion surgeon during the attack at Saipan.

Dr. G. E. Murphy, Lieutenant Colonel, Medical Corps, A.U.S., who served thirteen months overseas in World War I and almost three years in service in World War II, has resumed his practice at Birmingham with offices in the Empire Building. Dr. Murphy was stationed for several months at Walter Reed General Hospital, Washington, and since July 1942 has been Chief of the Eye, Ear, Nose and Throat Clinic of Oliver General Hospital at Augusta, Georgia.

University of Alabama Medical School temporary quarters will be housed on the sixth and fourteenth floors of the Jefferson Hospital, Birmingham, until permanent buildings for the school can be constructed. It is planned to move the sophomore class to Birmingham from Tuscaloosa by June 1 and to establish the four-year medical school by September 1.

DEATHS

Dr. Glenn Andrews, Montgomery, aged 82, died recently of tuberculosis.

Dr. Henry Clay Clements, Benton, aged 67, died recently of congestive heart disease and myocarditis.

Dr. Andrew L. Glaze, Birmingham, aged 56, died January 31.

ARKANSAS

Crawford County Medical Society has elected Dr. C. J. Crawford, Mulberry, President; Dr. S. D. Kirkland, Van Buren, Vice-President; and Dr. S. C. Grant, Mulberry, Secretary-Treasurer.

Cross County Medical Society has elected Dr. A. F. Barr, Cherry Valley, President; and Dr. Thos. Wilson, Wynne, Secretary-Treasurer.

Fifth Councilor District Medical Society has elected Dr. J. P. Clemens, Stephens, President; Dr. L. A. Longino, Magnolia, Vice-President; and Dr. E. J. Munn, El Dorado, Secretary-Treasurer.

Franklin County Medical Society has elected Dr. W. C. Porter, Ozark, President; Dr. E. W. Pillstrom, Ozark, Vice-President; and Dr. W. H. Gibbons, Secretary-Treasurer.

Hempstead County Medical Society has elected Dr. G. E. Cannon, President; Dr. L. M. Lile, Vice-President; and Dr. Don Smith, Secretary-Treasurer, all of Hope.

Johnson County Medical Society has elected Dr. Earle H. Hunt, President; Dr. Geo. L. Hardgrave, Vice-President; and Dr. G. R. Siegel, Secretary-Treasurer, all of Clarksville.

Lawrence County Medical Society has elected Dr. W. S. Kendall, Cave City, President; Dr. W. W. Hatcher, Imboden, Vice-President; and Dr. Chas. D. Tibbels, Black Rock, Secretary-Treasurer.

Little River County Medical Society has elected Dr. E. W. Yates, Foreman, President; Dr. Norman W. Peacock, Vice-President; and Dr. C. A. Harding, Ashdown, Secretary-Treasurer.

Nevada County Medical Society has elected Dr. T. W. McDaniel, Broughton, President; Dr. J. B. Hesterly, Prescott, Vice-President; and Dr. A. S. Buchanan, Prescott, Secretary-Treasurer.

Pulaski County Medical Society has elected Dr. John N. Compton, President; Dr. Hoyt R. Allen, Vice-President; and Dr. L. L. Fatherree, Secretary-Treasurer, all of Little Rock.

Searcy County Medical Society has elected Dr. E. G. Fendley, Leslie, President; Dr. W. T. Moore, Everton, Vice-President; and Dr. J. O. Leslie, Marshall, Secretary-Treasurer.

Arkansas State Board of Health has elected Dr. M. E. McCaskill, Little Rock, President; Dr. E. D. McKnight, Brinkley, Vice-President; and Dr. T. T. Ross, Little Rock, Secretary.

Dr. J. A. Summers, Little Rock, has been reappointed Pulaski County Health Officer.

Dr. A. K. Wayman, Little Rock, has been reappointed Superintendent of Pulaski County Hospital.

Dr. W. C. Riggin, Little Rock, who was recently discharged from military service, has been taking postgraduate work at New York Polyclinic.

Dr. C. G. Leverett, formerly of Eudora, and who has recently been discharged from military service, will be associated with the Holt-Krock Clinic, Fort Smith.

Continued on page 60

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Continued from page 58

Dr. R. L. Taylor, who has been discharged from military service, has resumed practice at Conway.

Dr. and Mrs. W. C. Russwurm, Helena, celebrated their golden wedding anniversary on January 10.

DEATHS

Dr. S. J. Wolferman, Fort Smith, aged 56, died February 18.

Dr. Madeline Muldoon Melson, Little Rock, aged 46, died January 12.

Dr. George L. Henderson, Conway, aged 73, died recently of hemiplegia.

Dr. Augustus Garland Lee, Texarkana, aged 70, died January 17 of cerebral hemorrhage.

Dr. Clyde Lipsey McNeil, Rogers, aged 52, died recently.

Dr. Junius Ruth, Rison, aged 59, died January 6.

Dr. Donald Meyers Ward, Colonel, Medical Corps, U. S. Army, North Little Rock, aged 38, died in Guadalcanal November 20, 1944.

DISTRICT OF COLUMBIA

Dr. Edward R. Stitt, Rear Admiral, retired, Washington, former Surgeon General of the United States Navy, was presented February 5 with a gold medal and an honorarium of $500 for outstanding service in the field of tropical medicine by the American Foundation for Tropical Medicine.

Washington Metropolitan Health Council, Washington, has been created under the sponsorship of the Health Division, Council of Social Agencies, of which Dr. Herbert P. Ramsey is head. Vice Admiral Ross T. McIntire, Surgeon General of the Navy, is Chairman of a Survey Committee to make a comprehensive survey of health and hospital facilities in Washington.

Georgetown University Hospital, Washington, which is expected to be completed in January 1946 at a cost of $2,420,000, will contain 400 beds. The Federal Works Agency has allotted $1,820,000 toward the cost.

Children's Hospital, Washington, has received a gift of $25,000 by Alexander Hecht, President of the Hecht Company, and Mrs. Hecht, toward the cost of the new hospital wing now under construction.

FLORIDA

Florida Public Health Association has elected Dr. Wieland W. Rogers, Jacksonville, President; Dr. George A. Dame, Jacksonville, and Mr. Russell Broughman, Sanitary Engineer, Miami, Vice-Presidents; and Dr. Edward M. L'Engle, Jacksonville, Secretary-Treasurer.

Medical Advisory Committee of the State Rehabilitation Service at its recent organization meeting elected Dr. Herbert L. Bryans, Pensacola, Chairman; Dr. Frank L. Fort and Dr. Henry Hanson, Jacksonville; Dr. James L. Anderson, Miami; and Dr. Rollin D. Thompson, Orlando.

Dr. Lester Wallace Cunningham and Miss Gertrude Jessie Reid, both of Mandarin, were married recently.

DEATHS

Dr. Jonathan Morias Larson, Hollywood, aged 71, died recently of postoperative shock following a cholecystectomy.

GEORGIA

Emory University will celebrate the one hundredth anniversary of the birth of Abner Wellborn Calhoun, born April 16, 1845, died August 21, 1910, the first professor of ophthalmology, Atlanta Medical College, which was established in 1845 and in 1915 became the School of Medicine of Emory University. Physicians are cordially invited to be the guests of Emory University at an

Continued on page 62

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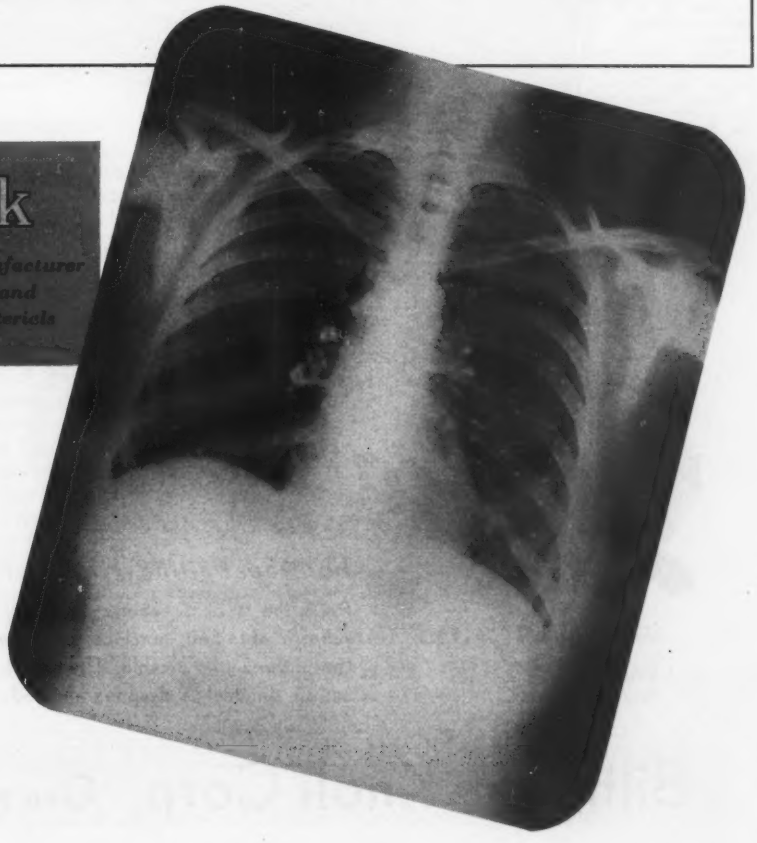

Continued from page 60

Ophthalmological Seminar, honoring the memory of Dr. Calhoun, to be held in Atlanta, April 19-21. Reservations should be made early at the Biltmore Hotel.

Glynn County Medical Society has elected Dr. T. V. Willis, President; Dr. M. E. Winchester, Vice-President; and Dr. Thomas W. Collier, Secretary-Treasurer, all of Brunswick.

Muscogee Medical Society has elected Dr. Bruce Threatte, President; Dr. O. D. Gilliam, Vice-President; and Dr. Leon Lapides, Secretary-Treasurer, all of Columbus.

Dr. Mary J. Erickson has resigned as pathologist of John D. Archbold Memorial Hospital, Thomasville, to enter private practice in Thomasville. She has been with the hospital since 1925.

DEATHS

Dr. Claude McKinley Burpee, Augusta, aged 47, died recently.

Dr. Marcus F. Carson, Griffin, aged 73, died recently.

Dr. Norman V. Collins, Griffin, aged 55, died recently.

Dr. Thomas Frederick Guffin, East Point, aged 69, died recently of uremia.

Dr. Herman William Hesse, Savannah, aged 68, died recently.

Dr. William H. F. Rhyne, Lafayette, aged 81, died recently.

Dr. William Farquhar Shallenberger, Atlanta, aged 63, died recently.

Dr. James R. Wells, Stone Mountain, aged 72, died January 1.

KENTUCKY

Bourbon County Medical Society has elected Dr. William Kenney, Paris, President; Dr. W. E. Davis, North Middletown, Vice-President; and Dr. D. B. Thurber, Carlisle, Secretary-Treasurer.

Boyd County Medical Society has elected Dr. Leslie D. Urban, President; Dr. L. H. Winans, Ashland, Vice-President; Dr. H. K. Kercheval Ashland, Treasurer; and Dr. H. K. Bailey, Pikeville, Secretary.

Daviess County Medical Society has elected Dr. B. H. Sigler, Hopkinsville, President; Dr. Mack Rayburn, Vice-President; and Dr. G. Ward Disbrow, Owensboro, Secretary.

Harlan County Medical Society has elected Dr. Tracy Jones, Evarts, President; Dr. J. W. Nolan, Harlan, Vice-President; and Dr. W. R. Parks, Harlan, Secretary-Treasurer.

Letcher County Medical Society has elected Dr. J. E. Crawford, Whitesburg, President; Dr. F. L. Wommack, Jenkins, Vice-President; and Dr. R. Dow Collins, Whitesburg, Secretary-Treasurer.

Lincoln County Medical Society has elected Dr. D. B. Southard, Stanford, President; Dr. W. B. O'Bannon, Stanford, Vice-President; and Dr. Lewis J. Jones, Hustonville, Secretary-Treasurer.

Madison County Medical Society has elected Dr. Ruby Paine, Berea, President; Dr. Louise Hutchins, Berea, Vice-President; and Dr. Chas. J. Grubin, Secretary-Treasurer.

Shelby County Medical Society has elected Dr. G. E. McMunn, Eminence, President; Dr. B. B. Sleadd, Middletown, Vice-President; and Dr. C. C. Risk, Secretary-Treasurer.

Union County Medical Society has elected Dr. G. B. Carr, Sturgis, President; Dr. H. B. Stewart, Morganfield, Vice-President; and Dr. Bruce Underwood, Morganfield, Secretary-Treasurer.

Whitley County Medical Society has elected Dr. H. L. Walden, Corbin, President; Dr. L. B. Crowley, Vice-President; Dr. C. A. Moss, Williamsburg, Secretary; and Dr. E. H. West, Williamsburg, Treasurer.

DEATHS

Dr. Roscoe Conklin Adams, Lexington, aged 67, died recently of hypertensive heart disease.

Dr. J. E. Anderson, McKee, aged 61, died recently of a heart attack.

Dr. Alvin Marion Belcher, Auburn, aged 71, died recently of injuries received in an automobile accident.

Dr. Oliver Wendell Brown, Falmouth, aged 70, died recently of carcinoma of the colon.

Dr. John David Fakes, Hickman, aged 75, died recently of cirrhosis of the liver.

Dr. C. I. Harris, Morganfield, aged 68, died recently of a heart attack.

Dr. C. F. Holtegel, Monticello, aged 53, died January 14.

Dr. Hardin I. Hughes, Hardin, aged 69, died recently of arteriosclerosis.

Dr. William S. Napper, Lebanon Junction, aged 84, died recently of chronic nephritis.

Dr. Benjamin Hamilton Parrish, Cloverport, aged 58, died recently of cerebral hemorrhage.

Dr. A. M. Zaring, St. Matthews, aged 74, died recently of pneumonia.

Continued on page 64

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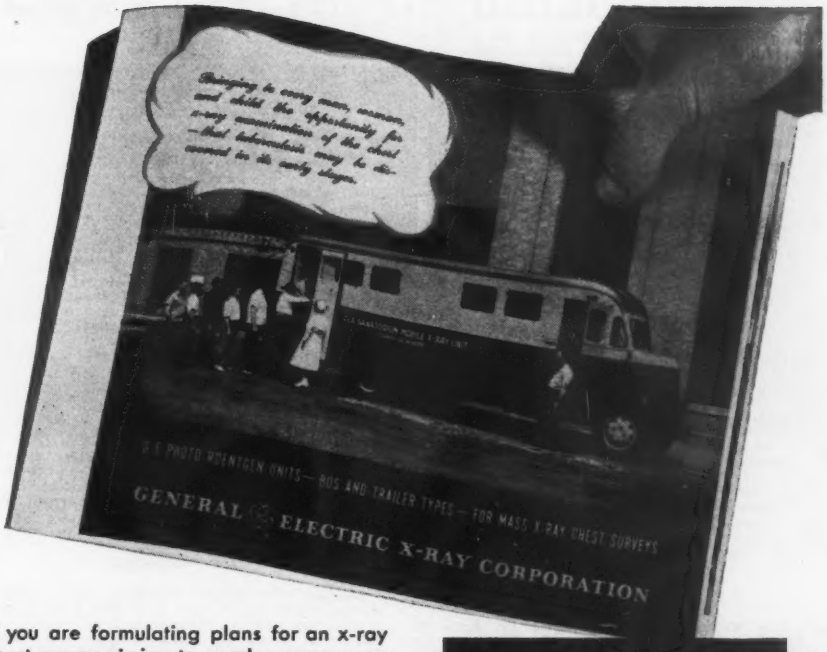
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Continued from page 62

LOUISIANA

Tuberculosis Symposium, sponsored jointly by the Louisiana State University School of Medicine, the National Tuberculosis Association, the Tuberculosis Control Division of the U. S. Public Health Service, and the Louisiana State Tuberculosis Association, will be held in New Orleans, April 17-19. Registration of out-of-state guests will be limited to 39. Registration should be made with Dr. C. A. Stewart, 1542 Tulane Avenue, New Orleans.

Bi-Parish Medical Society has elected Dr. B. F. Smith, Jackson, President; Dr. C. E. Sturm, Jackson, Vice-President; and Dr. E. M. Toler, Clinton, Secretary-Treasurer.

Beauregard Parish Medical Society has elected Dr. Thos. R. Sartor, President; Dr. Sam T. Roberts, Vice-President; and Dr. J. D. Frazar, Secretary-Treasurer, all of DeRidder.

Pointe Coupee Parish Medical Society has elected Dr. J. C. Roberts, New Roads, President; Dr. J. W. Plauche, Morganza, Vice-President; and Dr. F. F. Rougon, New Roads, Secretary-Treasurer.

Hotel Dieu, New Orleans, has installed Dr. Frank Chetta, President; and elected Dr. Lucien A. Fortier, Vice-President; Dr. Hugh T. Beacham, Secretary-Treasurer; and Dr. W. A. Gillaspie, Dr. Monte F. Meyer and Dr. C. Walter Mattingly, members of the Board.

Mercy Hospital, New Orleans, has installed Dr. N. J. Tessitore, President of the Staff; Dr. William H. Roeling, Vice-President; Dr. C. J. Vedrenne, Secretary; Dr. Everett L. Drewes, Treasurer; and Dr. R. J. Mailhes and Dr. Louis Monte, members of the Board.

Dr. Edmund Connely, New Orleans, was recently appointed City Alienist and exofficio head of the city hospital for mental diseases.

Catholic Physicians' Guild, New Orleans, has elected Dr. Edwin L. Zander, President; Dr. N. F. Thiberge, Vice-President; Dr. Theo. F. Kirn, Secretary; and Dr. P. A. Boudreaux, Treasurer.

Dr. Frank E. Lamothe, New Orleans, has been elected assistant rabban of Jerusalem Temple of the Shrine for 1945 and Dr. Abe Mattes, New Orleans, was elected high priest and prophet.

Dr. Theo. J. Dimitry, New Orleans, has received a citation for services for over twenty-five years as a faculty member of Loyola.

MARYLAND

Baltimore City Medical Society has elected Dr. Louis H. Douglass, President; Dr. Alfred Blalock, Vice-President; Dr. Samuel McLanahan, Secretary; and Dr. J. Albert Chatard, Treasurer, all of Baltimore.

Baltimore Association of Private Practicing Psychiatrists was recently organized to investigate the problems of private psychiatric practice in the community. Planning Committee is composed of Dr. Wendell S. Muncie, Chairman, Dr. Horace K. Richardson and Dr. Robert V. Seliger.

Dr. Paul William Spear, Baltimore, and Miss Belle Kazan, New York City, were married recently.

DEATHS

Dr. Brooke Ignatius Jamison, Emmitsburg, aged 62, died recently when struck by an automobile.

MISSISSIPPI

Dr. Felix J. Underwood, Executive Officer, Mississippi State Board of Health, Jackson, was presented one of the two 1944 awards of the Albert and Mary Lasker Foundation at the twenty-fourth annual dinner meeting in New York of the Planned Parenthood Federation of America, the award being $500 in cash along with a plaque and a scroll. The award was given to Dr. Underwood in recognition of his state's expanded health program "including planned parenthood services as an integral part of the public health program of the State of Mississippi."

DeSoto County Medical Society has elected Dr. C. W. Emerson, Hernando, President; Dr. J. M. Wright, Hernando, Vice-President; and Dr. L. L. Minor, Route 4, Memphis, Tennessee, Secretary-Treasurer-Editor.

Tri-County Medical Society has re-elected Dr. Thomas Burk, Hazelhurst, President; Dr. T. F. McDonnell, Hazlehurst, Vice-President from Copiah County; Dr. E. E. Busby, Brookhaven, Vice-President from Lincoln County; and Dr. R. B. Zeller, Hazlehurst, Secretary-Treasurer.

Vicksburg Hospital, Incorporated, and the Vicksburg Clinic announce the association of Dr. James Walter O'Dell, formerly of Henry Ford Hospital, Department of Surgery, Detroit, Michigan.

Mississippi Public Health Association's newly elected officers are Dr. C. M. Shipp, Bay St. Louis, President; Dr. A. L. Gray, Jackson, President-Elect; and Dr. R. L. Simmons, Meridian, head of Administrative Section.

MISSOURI

Missouri State Medical Association has cancelled its annual meeting which was to have been held April 22-24.

Mississippi Valley Medical Society recently installed Dr. Grayson L. Carroll, St. Louis, President; and elected Dr. Louis H. Jorstad, St. Louis, as one of the Vice-Presidents. It will hold its eleventh annual meeting at the Hotel Jefferson, St. Louis, September 5-7.

Continued on page 66

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Natural B-Complex and High Quality Protein

VIOBIN, defatted, wheat germ, is among the richest of all protein foods (39%), of biologic quality equal to animal protein; an excellent natural source of the B-Complex. It is fully prepared, ready to use, and of palatable, nutty flavor. . . . VioBin is perfectly stable and will not become rancid or deteriorate. . . . Two tablespoonfuls daily can well bring the average diet to optimum levels. . . . Literature and sample on request. . . . VioBin, Monticello, Ill.

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Riboflavin	0.008 mg.	Inositol	2.500 mg.
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VioBin

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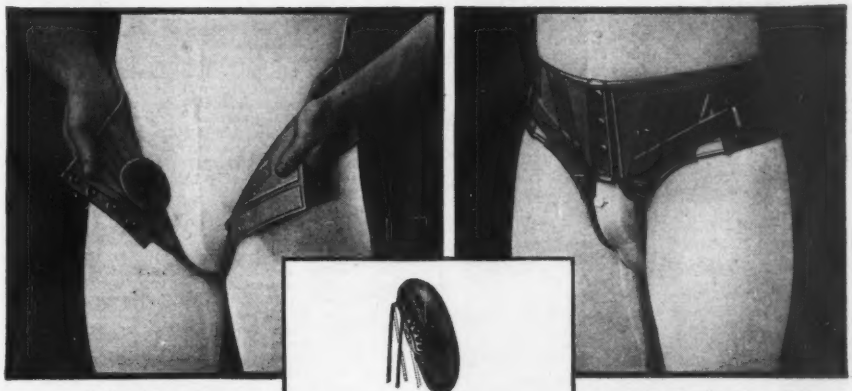

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(Patented)

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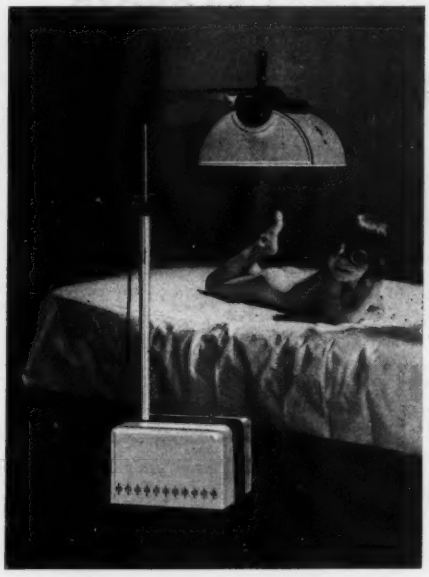

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The Burdick QA-250 Ultraviolet Lamp is often prescribed by physicians for use at the bedside in the Home or Hospital. Write for further information.

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MILTON WISCONSIN

Continued from page 64

Kansas City Ophthalmology, Otology, Rhinology and Laryngology Society will present an oil painting of Dr. Hal Foster, Kansas City, to the American Academy at its meeting in Chicago in October 1945. The Academy, celebrating its fiftieth anniversary at that time, was founded by Dr. Foster at a meeting in Kansas City.

Dr. Eugene R. Brown has been elected President of the St. Louis Chirurgical Society.

Dr. Harriet H. S. Cory, St. Louis, Executive Director, Missouri Social Hygiene Association, is visiting Puerto Rico, Cuba, Haiti and the Virgin Islands as a representative of the American Social Hygiene Association, assisting in the organization of local hygiene associations for the prevention of social diseases.

St. Louis University School of Medicine will have, as planned in the $2,600,000 postwar expansion program, an addition of a new four-story brick building to cost $500,000. Work will start immediately on release of permission by the WPB.

Deaths

Dr. George Edwin Hourn, St. Louis, aged 66, died recently.

Dr. K. W. Kittelberger, Hallsville, aged 44, died recently.

Dr. Logan Clendening, Kansas City, aged 60, died January 31.

Dr. Thomas Enoch Ferrell, Mountain View, aged 74, died recently of coronary occlusion.

Dr. Frank DeVore Gorham, St. Louis, aged 56, died recently of carcinoma of the sigmoid.

Dr. John Rhodes Lewis, Kansas City, aged 48, died recently of coronary thrombosis.

Dr. John Franklin Jones, Linn, aged 81, died recently of cerebral hemorrhage.

Dr. Lewis Emory Missimore, St. Louis, aged 67, died recently of heart disease.

Dr. Frederick Phillip Parker, St. Louis, aged 75, died recently of coronary thrombosis.

Dr. Philip McClellan Steckman, Plattsburg, aged 79, died recently of esophageal hemorrhage.

Dr. Abram Edwin Platter, Memphis, aged 78, died recently.

Dr. Herman Elwyn Pearse, Bonner Springs, aged 84, died recently.

NORTH CAROLINA

Edgecombe-Nash Counties Medical Society has elected Dr. Marvin L. Stone, Rocky Mount, President; Dr. John E. Wright, Macclesfield, First Vice-President; Dr. Junius R. Vann, Spring Hope, Second Vice-President; and Dr. James P. Bunn, Rocky Mount, Secretary-Treasurer.

Dr. David Cayer, formerly of Duke University, Durham, has assumed duties as Assistant Professor of Medicine, Bowman Gray School of Medicine, Winston-Salem.

Dr. Joy V. Sykes, Captain, Medical Corps, AUS, Rocky Mount, has received an honorable discharge from the army and has returned to his home.

Dr. Edwin C. Hamblen, Durham, is on the Board of Directors of the new organization, the American Society for the Study of Sterility.

Dr. Lynwood Earl Williams and Miss Dorothy Dean Wells, both of Kinston, were married recently.

Dr. John D. Christian, Rocky Mount, and Miss Virginia Rupprecht, New Brunswick, New Jersey, were married recently.

Continued on page 68

Foley **FOOD MILL**

Conserves mother's time and energy in straining fresh vegetables and fruits. With just a few twists of the wrist, the Foley Food Mill separates fibres and hulls and purees any cooked food fine enough for the smallest baby or for any adult diet—peas, carrots, beets, string beans, spinach, apple sauce, prunes. Made of steel, rust- and acid-resistant. Declared essential by War Production Board. At department and hardware stores.

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Continued from page 66

DEATHS

Dr. Charles Z. Candler, Sylva, aged 67, died recently of coronary occlusion.

Dr. Richard William Finley, Chapel Hill, aged 54, died recently of heart disease.

Dr. John Reeves Gamble, Lincolnton, aged 57, died recently.

Dr. George M. Pate, Rowland, aged 67, died recently of pneumonia.

OKLAHOMA

Caddo County Medical Society has elected Dr. C. B. Sullivan, Carnegie, President; Dr. E. L. Inman, Apache, Vice-President; and Dr. P. H. Anderson, Anadarko, Secretary-Treasurer.

Carter County Medical Society has elected Dr. J. L. Cox, Ardmore, President; Dr. C. A. Johnson, Vice-President; and Dr. H. A. Higgins, Ardmore, Secretary-Treasurer, re-elected.

Garvin County Medical Society has elected Dr. M. E. Robberson, Wynne Wood, President; Dr. A. H. Shi, Stratford, Vice-President; and Dr. John R. Callaway, Pauls Valley, Secretary-Treasurer.

Okmulgee County Medical Society has elected Dr. W. M. Haynes, Henryetta, President; Dr. H. L. Rains, Okmulgee, Vice-President; and Dr. J. C. Matheny, Okmulgee, Secretary-Treasurer.

Payne County Medical Society has elected Dr. Haskell Smith, Stillwater, President; Dr. H. C. Manning, Cushing, Vice-President; and Dr. L. E. Silverthorn, Stillwater, Secretary-Treasurer.

Pottawatomie County Medical Society has elected Dr. Charles W. Haygood, President; Dr. W. B. Mullins, Vice-President; and Dr. Clinton Gallaher, Secretary-Treasurer, all of Shawnee.

Tulsa County Medical Society has installed Dr. Homer A. Ruprecht, President; and elected Dr. John C. Perry, President-Elect; Dr. R. Q. Atchley, Vice-President; and Dr. E. O. Johnson, Secretary-Treasurer, all of Tulsa.

Washington-Nowata County Medical Society has elected Dr. J. V. Athey, Bartlesville, President, who for the past twenty consecutive years has served as Secretary-Treasurer; Dr. R. C. Gentry, Bartlesville, Vice-President; and Dr. S. A. Land, Nowata, Secretary-Treasurer.

Woods County Medical Society has elected Dr. O. E. Templin, Alva, President; Dr. Wm. F. LaFon, Waynoka, Vice-President; and Dr. I. F. Stephenson, Alva, Secretary-Treasurer.

DEATHS

Dr. John Ernest Heiss, Perry, aged 60, died recently of heart disease.

Dr. Elmer C. Ludlum, Carmen, aged 69, died recently of coronary thrombosis.

Dr. John A. Walker, Shawnee, aged 79, died recently.

Continued on page 70

Classified Advertisements

EDITING—Preparation of papers and reports, indexing, abstracting, bibliographies and similar services to physicians. Address inquiries to Elizabeth M. McFetridge, M.A., 4810 St. Charles Avenue, New Orleans 15, Louisiana.

FOR SALE—Complete office equipment including large medical library, necessary instruments and furniture of the late Dr. T. B. Wingo. Good location for a doctor. If interested write Mrs. T. B. Wingo, 316 Main Street, Martin, Tennessee.

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Continued from page 68

SOUTH CAROLINA

Dr. John Parker has returned to Greenville for the practice of medicine and x-ray work.

Dr. R. M. Pollitzer, Greenville, has been elected President of General Hospital staff.

Dr. John F. Simmons, Greenville, has been elected President of the St. Francis Hospital staff.

Dr. Audrey Gunn, Columbia, has been elected head of the X-Ray Department, Columbia Hospital.

Dr. Isadore Schayer, Colonel, Medical Corps, AUS, Columbia, has been placed in charge of the Thompson Memorial Infirmary of the University of South Carolina, relieving Dr. F. M. Routh, who is on sick leave.

Dr. Charles B. Hanna, Charleston, and Miss Lena Mae Bryant, Nichols, were married recently.

Dr. James Jackson Hutson, Charleston, and Miss Miriam Poe Hickman, Wilmington, North Carolina, were married recently.

Deaths

Dr. Belton Allen Bennett, Jr., Medical Corps, U. S. Navy, Greer, aged 31, lost his life December 2, 1944, when his ship, the Cooper, a destroyer, was torpedoed and sunk in Ormac Bay off western Leyte.

Dr. Thomas Earle Morrow, Greenville, aged 78, died recently.

TENNESSEE

Tennessee State Medical Association will not hold the regular annual meeting as scheduled for April 10-12.

Bedford County Medical Society has elected Dr. J. T. Gordon, Lewisburg, President; Dr. B. L. Burdette, Shelbyville, Vice-President; and Dr. W. H. Avery, Shelbyville, Secretary.

Davidson County Medical Society has elected Dr. Beverly Douglas, President; Dr. A. T. Sikes, Vice-President; and Dr. Harold E. Paty, Secretary-Treasurer, all of Nashville.

Putnam County Medical Society has elected Dr. Z. L. Shipley, President; Dr. Lex Dyer, Vice-President; and Dr. Thurman Shipley, Secretary-Treasurer, all of Cookeville.

Sevier County Medical Society has elected Dr. R. J. Ingle, President; Dr. R. A. McCall, Vice-President; and Dr. C. P. Wilson, Secretary, all of Sevierville.

Sullivan-Johnson County Medical Society has elected Dr. George W. Leavell, Bristol, President; Dr. J. V. Hodge, Kingsport, Vice-President; Dr. J. R. Butler, Mountain City, Vice-President; and Dr. Jarrett E. Williams, Kingsport, Secretary-Treasurer.

Memphis and Shelby County Medical Society has installed Dr. W. C. Colbert, President; and elected Dr. C. H. Heacock, President-Elect; Dr. E. G. Campbell, Vice-President; Dr. C. W. Croswell, Treasurer; and Dr. A. F. Cooper, Secretary.

Dr. Henry B. Brackin announces the opening of offices in the Doctors Building, Nashville, specializing in neuropsychiatry.

Dr. William Ross Buttram, Jr., Chattanooga, and Miss Augusta Lee Rees, Columbus, Georgia, were married recently.

Deaths

Dr. George W. Booker, Knoxville, aged 82, died recently of atrophy of the heart muscle.

Dr. Robert S. Hearn, Pinson, aged 69, died recently of bronchopneumonia.

Dr. Lewis Cowan Ramsay, Major, Medical Corps, U. S. Army, Memphis, aged 34, was killed in an airplane accident in Hanford, California, November 4, 1944.

Dr. Tazwell Brown Wingo, Martin, aged 71, died recently of congestive heart disease due to coronary insufficiency and diabetes mellitus.

TEXAS

Texas State Heart Association will hold its next annual meeting at Galveston, May 7.

Memorial Hospital Staff, Houston, has elected Dr. M. H. Latimer, President; Dr. Abbe A. Ledbetter, Vice-President; and Dr. Thomas P. Kennerly, Secretary.

Dr. G. F. Thornhill, Austin, has been elected President of the Travis County Chapter, American Red Cross.

Dr. J. M. Hill, Dallas, Director, William Buchanan Blood Plasma and Serum Center, Baylor Hospital, and Professor of Clinical Pathology, Southwestern Medical College, was recently

Continued on page 72

LaMOTTE BLOOD CHEMISTRY SERVICE

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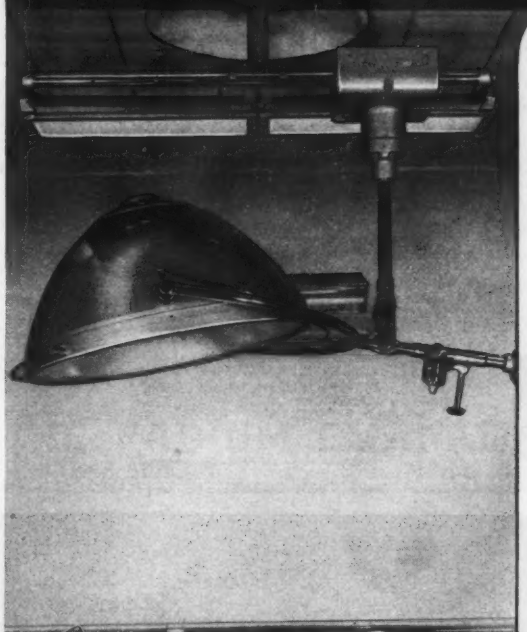

The

AMERICAN–1075 OPERATING TABLE

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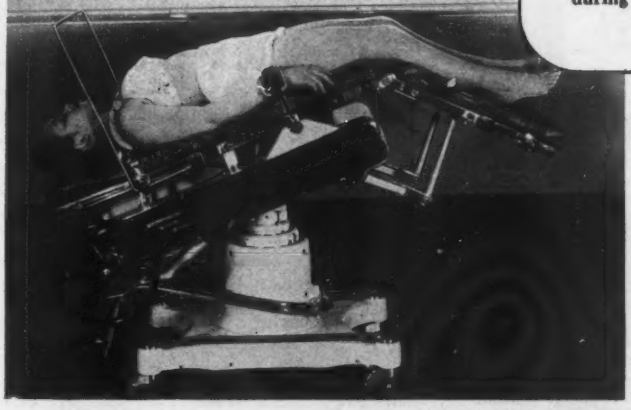
affords these two outstanding advantages–

First– **The positioning of the patient in an infinite number of different surgical postures while safely immobilized under the anesthetic.**

Second– **The positioning of the patient in such convenient relation to the operating surgeon that he may work comfortably and without undue fatigue while sitting or standing during the operation.**



Note–The surgical light, illustrated, is another American product of superior design and quality.

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REAGENT SPECIALTIES
A complete line for clinical laboratories devoted to all branches of chemistry, bacteriology, hematology, and parasitology. Tested and checked in our own clinical laboratories. Purity warranted. Our facilities assure prompt shipment of large or small orders. Inquiries invited.
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R. B. H. Gradwohl, M. D., Director
3514 Lucas Av. St. Louis, Mo.

Continued from page 70

given the honorary degree of doctor *honoris causae* by the University of Guadalajara at a special ceremony in Guadalajara, State of Jalisco, Mexico.

Dr. George W. Cox, Austin, has been reappointed State Health Officer for the fifth two-year term.

Dr. Sidney Schnur, Major, Medical Corps, U. S. Army, Houston, has been awarded the Bronze Star Medal.

Dr. Francis M. Burke, Coleman, and Miss Ruth Pettus, Berkeley, California, were married recently.

Dr. J. L. Jackson, Wichita Falls, and Miss Frances Harris Lockhart, Galveston, were married recently.

Dr. R. B. Anderson and Mrs. Modena H. Landess, both of Fort Worth, were married recently.

Dr. Léon Jair Taubenhaus, College Station, and Miss Marjorie Vera Polon were married recently.

Deaths

Dr. Scott Carter Applewhite, San Antonio, aged 68, died recently of acute arteriosclerosis.

Dr. James Frank Gullette, Austin, aged 65, died recently of coronary thrombosis.

Dr. George Little Butler, Lieutenant Commander, Medical Corps, U. S. Navy, Beaumont, aged 34, was killed in action in the South Pacific war theatre.

Dr. D. Columbus Hyder, Donna, aged 69, died recently of carcinoma of the liver.

Dr. Floyd Franklin Kirby, Waco, aged 54, died recently.

Dr. Henry F. Kuehne, Coupland, aged 70, died recently of carcinoma of the prostate.

Dr. George William Kittelberger, Bowie, aged 44, died recently of brain tumor.

Dr. Marquis H. Maness, Roxton, aged 85, died recently of senility.

Dr. James Roller McMurray, Galveston, aged 42, died recently of osteomyelitis of the mandible.

Dr. James Kearney Miller, Sonora, aged 66, died recently of chronic pulmonary tuberculosis and tuberculosis of the larynx.

Dr. John Francis Nooe, Boerne, aged 71, died recently of coronary thrombosis.

Dr. Oscar C. Pabst, Tyler, aged 78, died recently of coronary thrombosis.

Continued on page 74

Woven with Cotton and "VINYON E" *for Greater Elasticity!* "ALOE" Cotton Elastic Bandage

Provides even, uniform, steadily maintained pressure—remains elastic

Aloe cotton elastic bandages are woven of long staple cotton and "VINYON E"—a vinyl resin yarn—which has been found to produce a superior type of elastic bandage because of its natural elasticity. These improved elastic bandages will provide even, uniform, easily controlled and steadily maintained pressure in all conditions where an elastic bandage is indicated. High quality feather-edge prevents binding. Special weave permits free movement, ventilation and circulation. Unlike most other elastic bandages, Aloe cotton elastic bandages with "VINYON E" do not have to be washed daily in order to retain their elasticity. Washing need only be done when bandage becomes soiled. Each size bandage listed below measures approximately 5½ yards when stretched and is furnished with two metal clips in cellophane wrapped and sealed package.

	Each
PH5934—Aloe Cotton Elastic Bandage with "VINYON E," 2-inch width	**$0.70**
PH5935—Same, 2½-inch width	**.85**
PH5936—Same, 3-inch width	**.95**
PH5937—Same, 4-inch width	**1.25**

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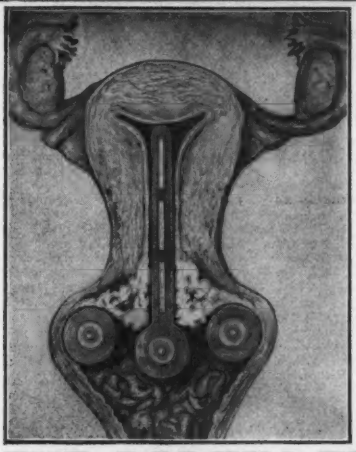
IMPROVE YOUR RESULTS IN CANCER OF THE CERVIX



CONSISTENTLY high percentages of 5-year cures in Carcinoma of the Cervix are reported by institutions employing the French technique illustrated here. Ametal rubber applicators encase the heavy primary screens and provide ideal secondary filtration to protect the vaginal mucosa. Radium or Radon applicators for the treatment of Carcinoma of the Cervix and provided with Ametal filtration are available exclusively through us. Inquire and order by mail, or preferably by telegraph or telephone reversing charges. Deliveries are made to your office or hospital for use at the hour you may specify.

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MARINOL
(IMPROVED FORMULA)

MARINOL (*IMPROVED FORMULA*) is an homogenized emulsion of cod liver oil and vegetable oils fortified with fish liver oils of high vitamin A potency to which has been added pure vitamin D_3.

OUTSTANDING PROPERTIES

PALATABILITY: The desirable properties of the fish liver oils have been retained without the disagreeable taste and odor.

HOMOGENIZATION: This assures a uniform and stable product that permits of easy miscibility with milk, special formulae, fruit or vegetable juices, or with water.

HIGH VITAMIN POTENCY: 5,000 U.S.P. units of vitamin A and 500 U.S.P. units of Vitamin D_3 supply the daily minimum requirements (FDA) in one teaspoonful.

LOW COST: A single teaspoonful daily is a prophylactic dose.

FOOD VALUE: Fish liver and vegetable oils supply another desirable property—that of caloric value.

EASY ADMINISTRATION is possible because of unusual potency of small dose.

CONSUMER PRICE: Bottle of 6 fl. oz. 85 cents. Bottle of 12 fl. oz. $1.50 (M.P.R. 392). HOW SUPPLIED: Bottles of 6 fl. oz. and 12 fl. oz.

FAIRCHILD BROTHERS AND FOSTER
70-76 Laight St., New York 13, N. Y.

Continued from page 72

Dr. Henry W. Grady Shytles, Abilene, aged 53, died recently of coronary occlusion.

Dr. Judson Ludwell, Taylor, Commander, Medical Corps, U. S. Navy, retired, Houston, aged 63, died recently of coronary occlusion.

Dr. Edwin Toutant Powell, San Antonio, aged 83, died recently following severe burns.

VIRGINIA

Danville-Pittsylvania Academy of Medicine has elected Dr. P. W. Miles, Danville, President; Dr. C. D. Bennett, Chatham, Vice-President; and Dr. S. Newman, Danville, Secretary-Treasurer.

Albemarle County Medical Society has elected Dr. Tiffany J. Williams, Charlottesville, President; Dr. M. K. Humphries, Vice-President; and Dr. W. Roy Mason, Charlottesville, Secretary-Treasurer, re-elected.

Northampton County Medical Society has elected Dr. S. K. Ames, Cape Charles, President; Dr. H. L. Denoon, Nassawadox, Vice-President; and Dr. W. Carey Henderson, Nassawadox, Secretary-Treasurer, re-elected.

University of Virginia Department of Medicine, Charlottesville, has received as a Book Fund for the Medical Library a gift of $5,000 from Dr. Stephen H. Watts, former Professor of Surgery. A gift of $500 has been received from Dr. Francis McGovern, Danville, for purchase of books in the field of Ophthalmology and Otolaryngology for the Medical Library.

Richmond Pediatric Society has elected Dr. T. Stanley Meade, President; Dr. Howard Urbach, Vice-President; and Dr. Edwin L. Kendig, Jr., Secretary-Treasurer.

Dr. Sam Silver, Captain, Medical Corps, AUS, Waynesboro, and Miss Leslie D. Purry, Brisbane, Queensland, Australia, were married recently.

Dr. Joseph Thomas Philips, Jr., Captain, Medical Corps, AUS, Norfolk, and Miss Anne Blair Pendleton, Newport News, were married recently.

Dr. Fred Carlton McCall, Lieutenant, Medical Corps, AUS, Norton, and Miss Evelyn Marguerite Carter, Farmville, were married January 1.

Dr. Ramon D. Garcia, Jr., Richmond, has been named Assistant Venereal Disease Control officer, pending appointment of a full time officer.

Dr. Newton A. Beeton, Vinton, has been made Medical Director of Reynolds Metals Company, Richmond, the first position of this kind in the Richmond area.

Dr. Cornelius E. Gorman, Lynchburg, and Miss Elizabeth Skender, Canton, Illinois, were married recently.

DEATHS

Dr. Jacob Oliver Hoffman, Harrisonburg, aged 84, died recently of acute prostatitis.

Dr. William Percy Jones, Urbanna, aged 68, died January 22.

Dr. William James Knight, Newport News, aged 72, died recently of coronary thrombosis.

Dr. Edward Thomas Glover, Portsmouth, aged 27, died January 11.

Dr. George Hume Steuart, Ottoman, aged 80, died January 6.

WEST VIRGINIA

Dr. Jos. P. Webb, Instructor in Medicine and Research Fellow in Aviation Medicine, University of Cincinnati College of Medicine, Cincinnati, Ohio, has been appointed Internist and Medical Director of Chesapeake and Ohio Hospital, Huntington.

Dr. Albert M. Price, Charleston, Director, Division of Communicable Diseases, State Health Department, has resigned that position and has been succeeded by Dr. Elias W. Langs, U. S. Public Health Service Reserve, former District Health Officer for Norfolk and Princess Anne Counties (Virginia).

Dr. Charles N. Scott, Nitro, has resigned as plant physician for the American Viscose Company to enter the Navy and the acting plant physician is Dr. John F. Cadden, Wilmington, Delaware, who has been serving on the Viscose medical staff.

Dr. Martin B. Woodward, Director, Division of Vital Statistics, State Health Department, Huntington, has resigned and is on the staff of the Washoe County General Hospital, Reno, Nevada.

Dr. William L. Musser, Clarksburg, and Miss Jeanette Elizabeth Whited, were married recently.

DEATHS

Dr. Henry Lisle Gamble, Moorefield, aged 70, died recently of cerebral hemorrhage.

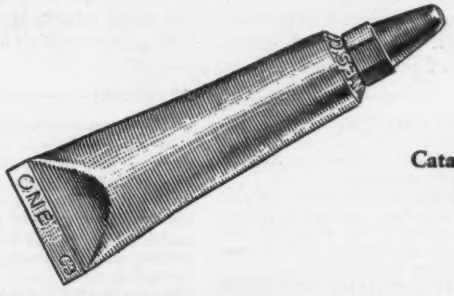
Dr. John Hamilton Hansford, Pratt, aged 80, died recently.

Dr. Clarence A. Rogers, Bluefield, aged 59, died recently of cerebral hemorrhage.

"M. E. S. CO."

OPHTHALMIC AND NASAL

Ointments



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CALCIUM - BROMINE THERAPY
with less tendency to bromism

MILD SEDATION . . . DERMATOSES

effervescent tablets . granules . ampuls

SANDOZ CHEMICAL WORKS, INC.

Pepsencia
WITH VITAMIN B_1

PEPSENCIA with VITAMIN B_1 contains the gastric enzymes, pepsin and rennin, coagulable nucleo-proteins, and all of the soluble constituents of the gastric juice, made directly from fresh hog stomach linings and calf rennets. VITAMIN B_1 has been added in the proportions of 125 U.S.P. units to each teaspoonful.

PEPSENCIA with VITAMIN B_1 is rigidly standardized, is stable, and is pleasant to take.

The recommended daily dosage supplies 375 U.S.P. units of vitamin B_1—equivalent to 12% more than the normal daily requirement as established by the Food and Drug Administration.

Originated and made by

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70-76 Laight Street
NEW YORK 13, N. Y.

It Can Happen Here

Example of severe rickets in a sunny clime.

LEST WE FORGET—we who are of the vitamin D era—severe rickets is not yet eradicated, and moderate and mild rickets are still prevalent. Here is a white child, supposedly well fed, if judged by weight alone, a farm child apparently living out of doors a good deal. This boy was reared in a state having a latitude between 37° and 42°, where the average amount of fall and winter sunshine is *equal to that in the major portion of the United States*. And yet such stigmata of rickets as *genu varum* and the quadratic head are plain evidence that rickets does occur under these conditions.

How much more likely, then, that rickets will develop among city-bred children who live under a smokepall for a large part of each year. True, vitamin D is more or less routinely prescribed nowadays for infants. But is the antiricketic routinely administered in the home? Does the child refuse it? Is it given in some unstandardized form, purchased from a false sense of economy because the physician did not specify the kind?

A uniformly potent source of vitamin D such as Oleum Percomorphum, administered regularly in proper dosage, can do more than protect against the gross visible deformities of rickets. It may prevent hidden but nonetheless serious malformations of the chest and the pelvis and will aid in promoting good dentition. Because the dosage is measured in *drops*, Oleum Percomorphum is well taken and well tolerated by infants and growing children.

EXIGENCY OF WAR

Oleum Percomorphum 50% is now known as Oleum Percomorphum with other Fish Liver Oils and Viosterol. The potency remains the same; namely, 60,000 vitamin A units and 8,500 vitamin D units per gram. It consists of the liver oils of percomorph fishes, viosterol, and fish liver oils, a source, of vitamins A and D in which not more than 50% of the vitamin D content is furnished by viosterol.

Supplied in 10 c.c. and 50 c.c. bottles; and as capsules in bottles containing 50 and 250.

MEAD JOHNSON & COMPANY, EVANSVILLE, INDIANA, U.S.A.

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$34,000.00
IN WAR BONDS AS PRIZES

For the best art works memorializing the medical profession's

"Courage and Devotion Beyond the Call of Duty"

(In War and in Peace)

42 PRIZES

21 OF THE 42 PRIZES ARE RESERVED FOR MEDICAL OFFICERS OF THE ARMED FORCES. THE OTHER 21 PRIZES ARE FOR CIVILIAN PHYSICIANS

The American Physicians Art Association, through the cooperation of Mead Johnson & Company, announces the following Prize Contest:

1. **SUBJECT:** "Courage and Devotion Beyond the Call of Duty" — on the part of members of the medical profession — in military or civilian practice. Any contestant may portray either the military or civilian aspect of the subject (or both, if shown in one piece).

2. **MEDIA:** The physician-artist's choice of one of the following:

   1. PAINTING in oil or egg tempera.
   2. WATER COLOR, transparent or opaque.
   3. SCULPTURE in any medium.
   4. DRAWING in any medium.
   5. PRINTS, including etching, engraving, lithography, wood block and linoleum block (on paper or cloth).
   6. PHOTOGRAPHY, including bromoil, tinted and kodachrome, as well as photo-montage.

   SUGGESTIONS: COMPLETE SKETCHES FOR MURAL DECORATIONS: In oil, egg tempera or water color drawing; PHOTO MURAL; BAS RELIEF SCULPTURE: are all eligible.

3. **ELIGIBILITY — See Footnote ★**

4. **DEFINITION — See Footnote ★**

5. **PRIZES: Forty-two prizes, divided amongst the two groups of physicians:**

To medical officers:	To civilian physicians:
1 $2,000 War Bond (E or F series)	1 $2,000 War Bond (E or F series)
10 $1,000 War Bonds (E or F series)	10 $1,000 War Bonds (E or F series)
10 $ 500 War Bonds (E or F series)	10 $ 500 War Bonds (E or F series)

No physician may submit more than one piece nor win more than one of the 42 prizes. No physician is eligible for a prize unless he also submits for exhibition at either the 1945 or the 1946 annual exhibition of the A.P.A.A. at least one other original work (not previously exhibited at an A.P.A.A. Exhibition) in any medium, on any subject of his own choice. Prizes will be awarded on a basis of conception and execution, irrespective of medium employed.

6. **JUDGES — See Footnote ★**

7. **EXPIRATION DATE — See Footnote ★**

8. **PURPOSE OF THE COMPETITION:** To memorialize the heroism and devotion of the medical profession in war and peace. All exhibitors (including prize-winners) shall retain ownership of their pieces. It is understood, however, that the A.P.A.A. shall have reproduction rights and also the privilege, for a period of three years after the close of the contest, of displaying prize-winning objects, at art museums, libraries, county medical societies, medical schools, hospitals, and similar institutions for the purpose of enhancing the public's estimate of the medical profession. The Association shall also have the right to offer institutions such as those mentioned above, the privilege of copying any of the prize-winning objects for use as murals, cornerstones, friezes, architectural designs, etc. — for the purpose of memorializing the medical profession's importance in war and in peace.

★ **FURTHER INFORMATION** available on request of the Association's Secretary, Dr. F. H. Redewill, Flood Bldg., San Francisco, Cal., or Mead Johnson & Co., Evansville 21, Ind., U.S.A.

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Used in the form of irrigations or wet packs, Tyrothricin, Parke-Davis, is effective against many gram-positive organisms.

Its antibacterial activity against streptococci, staphylococci, and pneumococci makes it of real therapeutic value when these organisms predominate in:

- Superficial indolent ulcers
- Mastoiditis
- Lesions of the skin and soft tissue
- Empyema
- Osteomyelitis
- Ear, nose, and throat infections.

TYROTHRICIN must not be injected. It is intended ***solely for topical use*** in the treatment of superficial infections, deeper infections made accessible by surgical procedures, and infections in body cavities in which there is no direct connection with the blood stream.

Supplied in 10 cc. vials, as a 2 per cent solution, to be diluted with sterile distilled water before use.

PARKE, DAVIS & COMPANY, *Detroit 32, Mich.*